City of Fresno

Mitigated Negative Declaration and Initial Environmental Study for the Dewatering Facility Upgrade Fresno-Clovis Regional Wastewater Reclamation Facilities

October 2010

MWH®

BUILDING A BETTER WORLD

CITY OF FRESNO

Fresno-Clovis Regional Wastewater Reclamation Facilities

Dewatering Facility Upgrade

Mitigated Negative Declaration and Initial Environmental Study

MWH Job No. 1007134

OCTOBER 2010

Prepared by:
MWH
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Arcadia, CA 91007

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MITIGATED NEGATIVE DECLARATION

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Project Description and Location

The proposed Project is the construction and operation of improved sludge dewatering facilities, an additional storage silo and associated yard piping adjacent to the existing sludge dewatering facilities, and widening and paving an access road on the site of the Fresno-Clovis Regional Wastewater Reclamation Facilities. The facilities construction would disturb at total of 3.2 acres on the existing plant site. The regional location of the Project and the Project site are shown in **Figure 1-1** and **Figure 1-2**, respectively, of the attached Initial Environmental Study (IES). A layout of proposed facilities is shown in IES **Figure 1-3**.

Lead Agency/Project Proponent

City of Fresno

State Clearinghouse Number

[to be assigned]

Contact Person

Mr. Raul Gonzalez, Project Manager (559) 621-5290

Proposed Finding

The City of Fresno City Council, having reviewed the Initial Environmental Study (IES) of this proposed Project, including the recommendation of the City's staff, does hereby find and declare that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent, the City of Fresno. A Mitigated Negative Declaration will be prepared.

The proposed Project will not result in any adverse effects which fall within the "Mandatory Findings of Significance" contained in Section 15065 of the California Environmental Quality Act (CEQA) guidelines. The facts supporting this finding are presented in the attached IES prepared for the Project and in the reference materials cited in the IES.

Mitigation Measures

Proposed language: "The City of Fresno City Council hereby finds that the adoption and implementation of the following mitigation measures will reduce to less than significant or avoid potentially significant effects of the proposed Project."

Biological Resources

BI-1 To mitigate for potential impacts on burrowing owls along the roadway to be widened and paved, the following actions shall be incorporated into the project specifications:

1. A preconstruction survey shall be conducted by a qualified biologist to examine potential burrows on the project site for the existence of burrowing owl. The survey shall be conducted within 30 days prior to any construction activities within 50 feet of the roadway to be repaved. Results of the preconstruction survey shall be prepared in a letter and given to the California Department of Fish and Game (CDFG) for their review and approval prior to any construction activities at the roadway.
2. If burrowing owl or active burrow is found, the CDFG 1995 guidelines, "Staff Report on Burrowing Owl Mitigation," shall be consulted and the City shall select one of the following measures for implementation by a qualified biologist:
   a. Destroy vacant burrows prior to March 1 and/or after August 31
   b. Redesign (reschedule) the roadway repaving project element temporarily or permanently to avoid occupied burrows or nest sites until after the nesting/fledging season (March 1 through August 31)
   c. Delay the roadway repaving project until after the nesting/fledging season
   d. Install artificial burrows in open space areas of the project site and wait for passive relocation of the burrowing owl
   e. Active relocation of the burrowing owl with conditions. The City shall fund relocation of burrowing owl to unoccupied, suitable habitat that is permanently preserved (up to 6.5 acres per nesting pair) at a recognized burrowing owl mitigation bank.

Cultural Resources

CUL-1: The Project specifications shall state that if previously unidentified and potentially significant archaeological resources (e.g., stone artifacts, dark ashy soils or burned rocks, or old glass, metal, or ceramic artifacts) become apparent during ground disturbances, work in that location shall be diverted and a qualified archaeologist shall be contacted immediately to evaluate the nature and significance of the find.

CUL-2: Before construction-related earthmoving activities and excavation at depths of 2 feet below the surface (into the Modesto Formation), the services of a qualified Principal Paleontologist shall be retained and consulted.

CUL-3: Consistent with Federal and State law, if fossils are discovered during excavation of the silo site, an approved Principal Paleontologist must be called to the site to develop mitigation measures to protect those resources. Based on the information in the PIR prepared for the

Project, the Paleontologist shall determine when and where monitoring will be required, and who will conduct it.

The Paleontologist shall coordinate with appropriate construction contractor personnel to provide information regarding applicable requirements concerning protecting paleontological resources. Contractor personnel, particularly heavy-equipment operators, shall also be briefed on procedures to be followed in the event that fossil remains and a currently unrecorded fossil site are encountered by earthmoving activities if a paleontological construction monitor is not on the site. Additional briefing shall be presented to new contractor personnel as necessary. Names and telephone numbers of the monitor and other appropriate mitigation program personnel shall be provided to appropriate contractor personnel.

When required, monitoring shall consist of visually inspecting freshly exposed cuts into the Modesto Formation, and spoil piles for the discovery and recovery of larger fossil remains, and periodically dry test screening to allow for the discovery and recovery of smaller fossil remains. If larger vertebrate fossils are noted by construction workers or monitors, excavation there will cease, and the monitor will be notified. The monitors will then notify the Principal Paleontologist.

The monitor and recovery staff will salvage all larger vertebrate fossil remains, as soon as practicable and as quickly as possible, under the supervision of the Principal Paleontologist following Society of Vertebrate Paleontology (1995) and State (Caltrans, 2007) guidelines. The monitor shall document the location and proper geologic context of any recovered fossil occurrence or rock or sediment samples. Any recovered rock or sediment sample from the Modesto Formation shall be processed to allow for the recovery of smaller fossil remains that normally are too small to be observed by the monitor. Pursuant to Society of Vertebrate Paleontology (1995) standard measures, no more than 6,000 pounds (12,000 pounds total) of sediment need be processed from the Modesto Formation.

If the Paleontologist or monitor determines that the fossil site is too unproductive or the fossil remains not worthy of recovery by the monitor, no further action will be taken to preserve the fossil site or remains, and earthmoving activities shall be allowed to proceed through the site immediately.

All fossil specimens recovered from the Project site as a result of mitigation, including those recovered as the result of processing rock or sediment samples, will be treated (i.e., prepared, identified, curated, catalogued) in accordance with designated museum repository requirements. Rock or sediment samples will be submitted to commercial laboratories for microfossil, pollen, radiometric dating, or other analysis, as appropriate.

The monitor shall maintain daily monitoring logs that include the particular tasks accomplished, the earthmoving activity monitored, the location where monitoring was conducted, the rock unit(s) encountered, the fossil specimens recovered, and associated specimen data and corresponding geologic and geographic site data. A final technical report of results and findings shall be prepared by the Paleontologist in accordance with any City requirement and archived at a repository mutually approved by the City and Paleontologist.

CUL-4: If human remains are uncovered, or in any other case when human remains are discovered during construction, the Fresno County Coroner is to be notified to arrange their proper treatment and disposition. If the remains are identified—on the basis of archaeological context, age, cultural associations, or biological traits—as those of a Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will determine the manner in which the remains are treated.

Proposed Conclusion

"The City of Fresno City Council hereby finds that the Mitigated Negative Declaration was prepared pursuant to the California Environmental Quality Act and reflects its independent judgment.

The location and custodian of the documents and any other materials that constitute the record of proceedings upon which the City of Fresno based its decision to adopt this Mitigated Negative Declaration are as follows:

Custodian:

City Clerk
City of Fresno
2600 Fresno Street, Room 2133
Fresno, California 93721
Phone: (559) 621-7650"

Section 1
Project and Agency Information

1.1 PROJECT TITLE AND LEAD AGENCY

Project Title:	Dewatering Facility Upgrade, Fresno-Clovis Regional Wastewater Reclamation Facilities
Lead Agency Name:	City of Fresno
Lead Agency Address:	5607 West Jensen Avenue Fresno, California 93706
Contact Person and Phone Number:	Mr. Patrick Wiemiller, Public Utilities Director (559) 621-8650 Mr. Raul Gonzalez, Project Manager (559) 621-5290
Project Sponsor:	Same as Lead Agency

1.2 PROJECT BACKGROUND AND OBJECTIVES

The proposed Project is the construction and operation of the biosolids (sludge) Dewatering Facility Upgrade and associated yard piping at the Fresno-Clovis Regional Water Reclamation Facility (RWRF) owned and operated by the City of Fresno, in Fresno County, California. The facility has a combined service area population of approximately 580,000, of which 495,000 are in Fresno and 90,000 in Clovis.

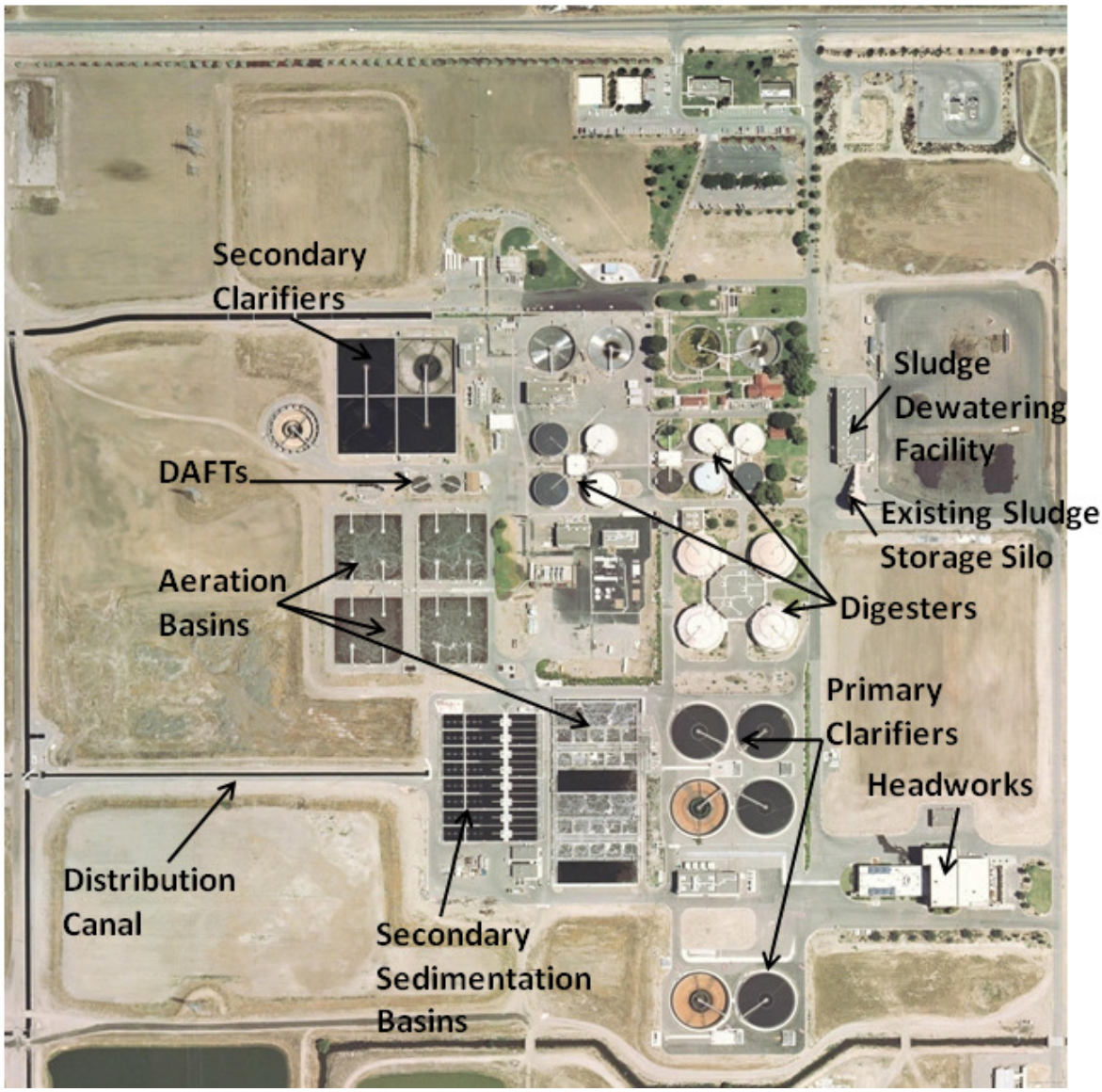
The City has prepared this environmental document to address the impacts of the construction and operation of the proposed Project. This Initial Environmental Study (IES) serves to identify the site-specific impacts, evaluate their potential significance, and determine the appropriate document needed to comply with California Environmental Quality Act (CEQA) guidelines.

1.3 PROJECT LOCATION AND ENVIRONMENTAL SETTING

The proposed Project facilities would be located at the RWRF, 5607 West Jensen Avenue, City of Fresno, Fresno County, California 93706. The regional location of the Project is shown in **Figure 1-1** and the location of the proposed facilities on the RWRF site in **Figure 1-2**. The approximate location is Section 22, Township 14 South, Range 19 East, Mount Diablo Base and Meridian (MDBM), or 36.704 north latitude, -119.890 west longitude. The facilities are located on the United States Geological Survey (USGS) Kearney Park 7.5 minute quadrangle. The proposed facilities' sites are surrounded by wastewater treatment facilities and percolation ponds. Land uses adjacent to the RWRF boundary are agricultural.

Figure 1-1
Regional Location

Figure 1-2
Existing Facilities



1.4 PROJECT DESCRIPTION

1.4.1 Current Facilities

The RWRF has a rated annual average design capacity of 80 million gallons per day (mgd); the RWRF provided treatment for an average flow of 68 mgd in 2008-2009. A portion of the RWRF effluent is recycled; the balance is discharged to percolation ponds. The biosolids generated from wastewater treatment are thickened, stabilized, and dewatered, and hauled to a facility for further treatment before the solids are land applied. The dewatered biosolids are called "cakes."

The sludge dewatering facility, housed within a Solids Dewatering Building, was constructed in the mid-1990s and consists of seven belt filter presses (BFPs) that drop dewatered sludge onto a belt conveyor. The belt conveyor conveys the sludge cake to an existing Serpentix conveyor that transports the sludge to the existing 430 cubic yard (cu yd) silo on the south side of the Solids Dewatering Building for truck loading. The current capacity of the existing facility is approximately 425 gallons per minute (gpm) of digested sludge. Typically, the current practice is to employ four of the seven BFPs.

1.4.2 Proposed Facilities

The Project will replace existing BFP dewatering equipment with centrifuge dewatering equipment and will provide new centrifuge dewatering units sufficient to process 425 gpm, with one of the centrifuges out of service. The Project will also provide the potential capability for future modification to allow up to 850 gpm of digested sludge to be dewatered by centrifuge, should that be called for in the future.

The objectives of the Project are to:

- increase the sludge dewatering facility reliability
- increase the sludge cake storage capacity by providing a new silo
- reduce hauling cost by the addition/use of centrifuges
- reduce the negative impacts of struvite (precipitate) formation

Several centrifuge layout and sludge cake conveyance options (based on centrifuge dewatering) were evaluated for the Schematic Design Report (MWH, 2010). The selected alternative consists of the following facilities:

- Three, 300-gpm centrifuges will be installed now; two centrifuges will provide the needed 425 gpm capacity needed at a moderate loading and the third centrifuge will serve as standby. Space is provided for future fourth and fifth centrifuges. Ultimately, up to 850 gpm of sludge could be processed with three machines and up to two standby units.
- A classifying conveyor and cake pump are dedicated to each centrifuge. Each centrifuge will drop sludge cake into a shaftless conveyor that will transfer the solids to the cake pump via a hopper.

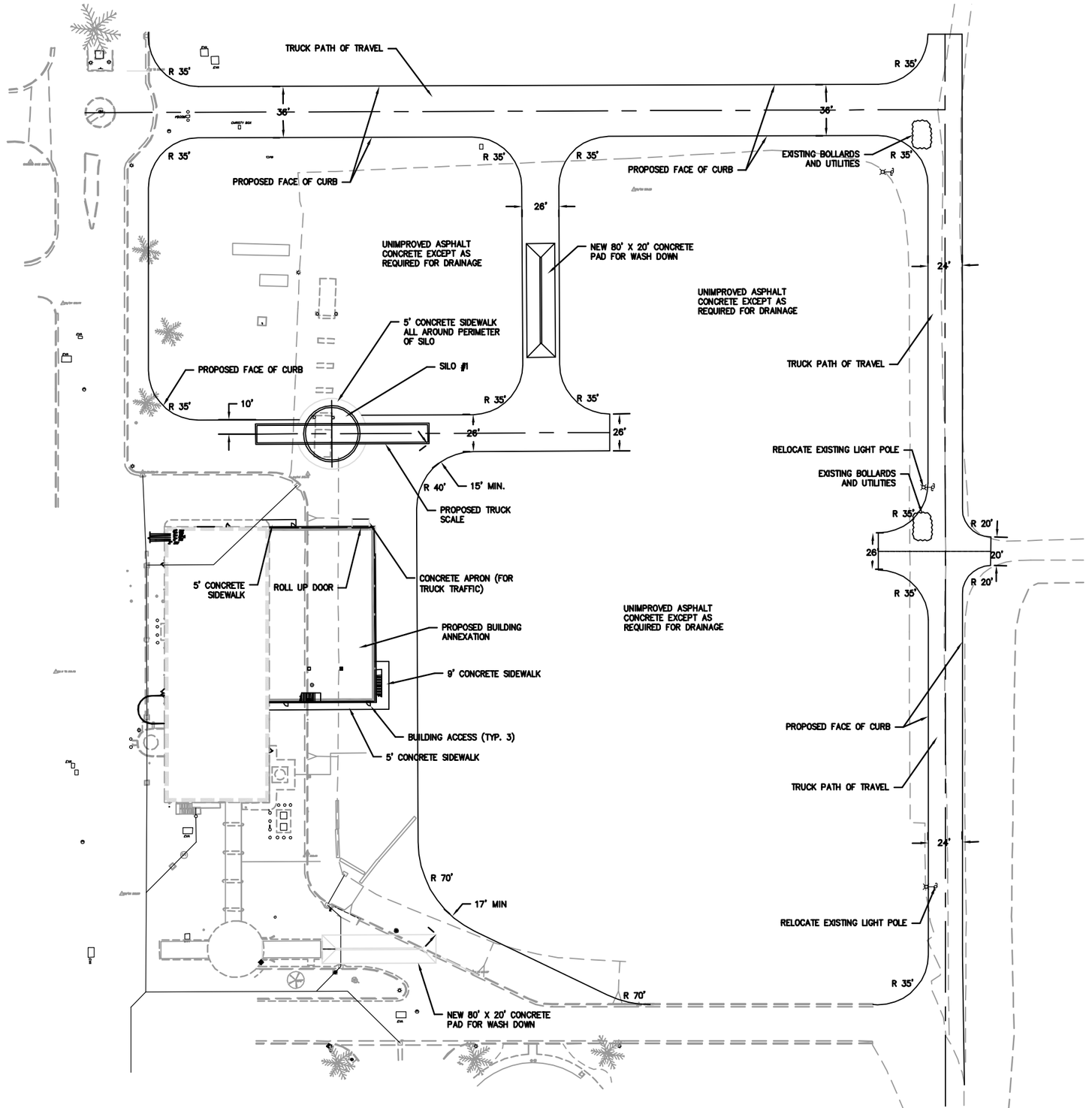
- The cake pumps will feed into a common header pipe that sends the cake to either the existing silo on the south side of the building or the new silo to be constructed on the north side. The new silo will be similar in construction to the current silo.
- Trucks will load from the silos for offsite hauling to the present McCarthy Farms location.
- Initially, two of the existing BFPs will be removed to allow the installation of three centrifuges. The five remaining BFPs will continue to dewater sludge while the centrifuge system is being constructed and commissioned. The BFPs can also serve as auxiliary back-up after the centrifuges are placed on line. The BFPs would need to be removed to accommodate the two future centrifuges.
- The cake pumps will be installed in an annex to the northeast side of the existing Solids Dewatering Building. The annex will be of similar construction to the existing building with a roll-up door to allow vehicle access for maintenance.
- A new silo sludge cake conveyance pipeline (buried) will connect to the north side of the building annex.
- When the annex is constructed, room will be provided for a fourth and fifth cake pump and for an electrical room on the second floor.

The proposed Project consists of the construction and operation of the following facilities (Refer to **Figure 1-3** for the Project site plan):

- A new sludge dewatering building annex, approximately 124 feet by 75 feet, with a height of 36 feet; the walls of the structure would be approximately 10 inches thick, built with reinforced concrete.
- Approximately 100 feet of yard piping 12 inches in diameter would connect from the dewatering building to the main plant drain.
- A second dewatered cake silo with truck transfer, to be constructed on the north side of the dewatering building. The silo would be 65 feet tall, including an approximately 4-foot-high handrail at the top of the structure, and 40 feet in diameter. The walls of the silo would be 27 inches thick (same dimensions as the existing silo on the other end of the building).
- A new buried pipeline, approximately 35 feet long, to connect the dewatering building to the silo.
- An existing sludge truck access road, now gravel, would be paved and widened in some areas. The total length of the upgraded road would be 2,000 linear feet, of which approximately one-fourth would be 36 feet wide and the balance 24 feet wide.

1.4.2 Construction Characteristics

Construction would involve site preparation, grading, and construction of the structures and yard piping. It is assumed that the construction equipment would move onto the site when needed and remain on site until that phase of the work was completed.



8/4/2010 3:44 PM C:\A-DELETE\fresno\SHEET\19951001-GR-SITE HORIZONTAL CONTROL.dwg -Catherine Corral

REV	DATE	BY	DESCRIPTION

SCALE 1"=40'

WARNING 0 ½ 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

DESIGNED RICH GLEASON
DRAWN BRAYDEN LOVIK
CHECKED ROD MCNEELY

MWH

CITY OF FRESNO
REGIONAL WASTEWATER RECLAMATION FACILITIES

DEWATERING FACILITY IMPROVEMENTS

SITE HORIZONTAL CONTROL AND PAVING PLAN

SHEET FIG-1-3

1007134

An average of approximately 20 to 30 construction personnel are anticipated to be working on the site at a time and workers would commute to the site daily.

Equipment and vehicles to be used during construction of the Project are estimated as follows:

Construction Equipment and Vehicles
Phase 1 - Site Preparation and Earthwork (2 Months Total Duration)
Backhoe
Blade/grader
Earthmover
Dump Truck
Frontend loader
Roller
Water truck
Pickup trucks
Workers' commutes
Phase 2 - Building Construction (6 Months Total Duration)
Grade-all/forklift
Crane
Backhoe
Air compressors
Materials deliveries -- concrete
Materials deliveries - rebar
Materials deliveries – roofing decking
Pickup trucks
Workers' commutes
Phase 3 - Construction Completion (10 Months Total Duration)
Grade-alls/forklifts
Air compressors
Water truck
Roller
Paver
Materials deliveries – centrifuges, pumps
Materials deliveries – rock and asphalt
Workers' commutes

Approximately 300 cu yd and 1,260 cu yd would be excavated during construction of the dewatering building annex and silo, respectively, for a total of 1,560 cu yd. Approximately 185 cu yd of soil would be excavated during construction of the yard piping. All suitable soils would be reused to backfill the trench once the pipes were installed. Remaining soils would be stockpiled on site. Disposal of removed asphalt paving would require less than 5 haul trips to a landfill.

Construction of the yard piping would involve excavation of the trench, bedding placement, pipe installation and backfill. The maximum trench depth would be 10 feet and the maximum width of the trench would be 6 feet. The piping would be generally located east of the existing dewatering facility, and immediately east of the new and existing silos.

Construction is anticipated to occur over an 18-month period beginning in spring 2011. Construction phasing would proceed as follows:

- Site preparation would require approximately 2 months
- During the next 6 months the silo, building annex and yard piping would be constructed.
- During the following 10 months, the equipment would be delivered and installed and tested; final paving and finishing would occur within the last month.

No landscape vegetation would be affected by Project construction or operation and none is proposed.

A temporary construction NPDES permit is required for all construction projects that disturb one acre or more. Construction of the proposed Project facilities is expected to disturb approximately 3.2 acres; therefore, a construction SWPPP would be required to comply with the State Water Resources Control Board General Permit for Stormwater Discharges Associated with Construction Activity (Water Quality Order 99-08-DWQ). It is anticipated that the construction contractor would process the SWPPP.

1.4.3 Operational Characteristics

The proposed facilities would be owned and operated by the City. No new employees would be hired to operate the facilities.

Sludge processing would occur year-round, 24 hours per day, 7 days per week. The facility current averages 289 wet tons per day of cake production and transport. Each haul truck has a capacity of 20 tons per load, and the facility currently hauls approximately 14 to 15 loads per day to an off-site location (McCarthy Farms). The Project would reduce cake transport by approximately 77 wet tons per day, to 212 wet tons per day, which in turn would reduce cake off site transport to approximately 10 to 11 truckloads per day on average.

Polymer and ferric chloride are currently used at the RWRF. Proposed facilities include new chemical storage and handling for polymer; no new ferric chloride facilities are required. Polymer is mixed with treated biosolids to enhance the dewatering process and ferric chloride is added to the digesters to prevent struvite formation in piping and equipment. Under existing conditions, polymer used with belt presses totals approximately 204 gallons per day (gpd) (neat emulsion polymer). Approximately 313 gpd of neat emulsion polymer would be used in the centrifuge during Project operation. Currently, approximately 1,200 gpd of ferric chloride is used; approximately 1,824 gpd is proposed to be used during Project operation.

The exterior of the new dewatering building annex would be lit from approximately 4 new poles.

In 2009, the existing dewatering facility used 3.96 million kilowatt hours per year (kWh/yr). The proposed facility would use an estimated 4.89 million kWh/yr, for an additional 930,000 kWh/yr over 2009 conditions, a 23 percent increase. Electricity would be supplied by Pacific Gas & Electric Company (PG&E). The RWRF would continue to meet a portion of its existing power demand from onsite energy, burning methane and natural gas generated by sludge digestion.

1.5 RELATIONSHIP OF PROJECT TO OTHER PLANNING

1.5.1 Water Quality Control Plan

The Project area is located within the Tulare Lake Basin region of the California Regional Water Quality Control Board, Central Valley Basin Region (5F). The Water Quality Control Plan (Basin Plan) for the region presents designated beneficial uses and water quality objectives for local surface waters and groundwaters. The relationship of the project to the Basin Plan is discussed in **Section 2.3.9** of this IES.

1.5.2 General Plans

The Project would be constructed in the City of Fresno, which has an adopted General Plan (City of Fresno, 2002). The proposed facilities would be constructed on paved areas or graded open land adjacent to the existing dewatering facilities within the existing RWRF. Therefore, there would be no effects on zoning or general plan land use of the dewatering facility upgrades and related piping. No change in zoning or land use on the site would be created by the Project. Therefore, the Project would be in compliance with the City of Fresno General Plan.

1.5.3 Regional Transportation Plan

The 2007 Fresno County Regional Transportation Plan (RTP) for the area includes the Project area (Fresno COG). No changes in offsite roadway use would result from the proposed Project and no new roadways or other transportation methods would be required. Therefore, the Project would be in compliance with the RTP.

1.5.4 Regional Housing Allocation Plans

The proposed Project includes no housing. Therefore, demonstrating consistency with Regional Housing Allocation Plans is not applicable to the proposed Project.

1.5.5 Air Quality Plan

The proposed Project is located in the Central Valley San Joaquin Basin, under the jurisdiction of the San Joaquin Valley Unified Air Quality Management District (SJVUAQMD). Consistency of the proposed Project with applicable air quality plans is analyzed in **Section 2.3.3** of this IES.

1.5.6 Habitat Conservation Plans

There is no adopted state Natural Communities Conservation Plan (NCCP) and no adopted federal habitat conservation plan (HCP) that cover the proposed Project site. The U.S. Fish and

Wildlife Service reported (USFWS, 2008) that Fresno County received a grant to develop a multi-species HCP-NCCP to conserve agricultural lands and natural habitats at risk from urban development. The Plan is in development.

PG&E developed an HCP for the operation and maintenance of its facilities in the San Joaquin Valley. The Final EIR/EIS was published in 2007 (PG&E, 2007). The PG&E HCP-NCCP would not apply to the proposed Project site.

1.5.7 Regional Land Use Plans

The proposed Project is not within the coastal zone, the Lake Tahoe Basin, the San Francisco Bay area or Santa Monica Mountains. Therefore, a consistency determination with these regional land use plans is not applicable to the proposed Project.

1.6 PROJECT APPROVALS

Planning and regulatory agencies that have potential permit or approval authority over the proposed Project are the following:

Agency	Permit or Approval Authority
California Department of Transportation, Transportation Permits Branch	Permit for transport of heavy construction equipment on State Highways
State Water Resources Control Board	Stormwater Pollution Prevention Plan
Regional Water Quality Control Board	Review of revised unit process descriptions
City of Fresno	City haul permit Conditional Use Permit amendment

Section 2
Environmental Analysis

2.1 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Greenhouse Gas Emissions	☐ Population and Housing
☐ Agricultural and Forestry Resources	☐ Hazards and Hazardous Materials	☐ Public Services
☐ Air Quality	☐ Hydrology and Water Quality	☐ Recreation
☐ Biological Resources	☐ Land Use and Planning	☐ Transportation and Traffic
☐ Cultural Resources	☐ Mineral Resources	☐ Utilities and Service Systems
☐ Geology and Soils	☐ Noise	☐ Mandatory Findings of Significance

2.2 AGENCY DETERMINATION

On the basis of this initial evaluation:

☐ I find that the project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the applicant. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Determination

Approved by: _____ Date: 9-24-10

Assistant Director, Wastewater Management Division, City of Fresno

2.3 ENVIRONMENTAL CHECKLIST

2.3.1 Aesthetics

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Discussion:

a) and c) **Less than Significant Impact**. Scenic vistas are those that offer high-quality views of the natural environment. Existing views at the Project site consist of an existing RWRF with percolation ponds to the west and south. As such, current views into the construction site would consist of earth moving activities and construction equipment and vehicles.

The RWRF is surrounded by agriculture; the proposed facilities sites by an existing dewatering building and paved and open land within the RWRF. During construction, minor temporary effects on visual quality may occur from earth moving activities and the presence of construction equipment and vehicles, similar to current conditions. Once construction is complete, the proposed dewatering facility would be a roofed concrete building with architectural features match the existing building, approximately 36 feet in height and about 6,350 square feet in area; a concrete silo, approximately 65 feet tall, 41 feet in diameter near one end; and connecting structures. The facility would look substantially similar to the existing dewatering building and silo; the yard piping would be buried. Therefore, the impact on visual characteristics of the site would be less than significant.

b) **No Impact.** The Project site is not located in the vicinity of any officially designated State or County scenic highways or highways that are eligible for designation (Caltrans, 2007; Fresno County, 2005). Furthermore, the new dewatering facility upgrades would not be visible from any highway and the yard piping would be buried. Therefore, the proposed Project would have no impact on scenic resources within a state scenic highway. Similarly, the Project would have no damage to rock outcroppings or historic buildings, since these features are not present on or directly adjacent to the proposed site.

d) **Less Than Significant Impact.** Project-related construction activities would not require lighting because activities would be scheduled to take place during daylight hours. Exterior

lighting would consist of up to 4 new poles installed adjacent to the new dewatering facility annex. Lighting would be shielded and directed onto the site and away from adjacent properties. It is anticipated that the metal doors would be painted with matte-finish paint, so there would be no glare from this surface. The exterior walls would be concrete. Therefore, the Project would not create a substantial new source of light or glare from the booster station and impacts would be less than significant.

2.3.2 Agriculture and Forestry Resources

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined in Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion:

a) through e), except b) **No Impact.** The proposed Project site is not located on state-designated Farmlands or Unique Farmland on the maps prepared by the Department of Conservation as part of the Farmland Mapping and Monitoring Program (California Department of Conservation, 2008). The RWRF is incorporated City land surrounded by unincorporated Fresno County land, much of which is in Williamson Act contracts. There is no forest land in the vicinity. As such, the Project would not result in the loss of forest land or conversion of forest land to non-forest use, as the site is used, and will continue to be used, for wastewater treatment. Therefore, the proposed Project would have no impact on state-designated Farmland or forest lands.

b) **No Impact.** The proposed Project site is not designated as an agricultural preserve under the provisions of a Williamson Act contract (California Department of Conservation, 2008). In addition, the dewatering facilities would not result in the conversion of farmland to non-

agricultural use. Therefore, the proposed Project would not conflict with existing zoning for agricultural use or a Williamson Act contract. No impacts would occur.

2.3.3 Air Quality

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

Discussion:

The climate of the Project area is Mediterranean, with wet winters and hot, dry summers. Annual precipitation averages 11 inches and falls primarily between November and March. Average high temperature in July is 97 degrees F; December average low temperature is 37 degrees F (rssweather.com, 2010).

The Project area is located within the San Joaquin Valley Air Basin (SJVAB), which includes Fresno County. The Fresno County portion of the SJVAB is regulated by the San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD). The San Joaquin Valley is designated by the State as a non-attainment area for ozone (8-hour), particulate matter 10 microns or less in diameter (PM10), and particulate matter 2.5 microns or less in diameter (PM2.5). The Valley is designated in attainment/unclassified for carbon monoxide (CO) (SJVUAPCD, 2007).

SJVUAPCD is guided by adopted plans for PM10, PM2.5, and ozone (8-hour) to reduce air emissions in the San Joaquin Valley. On October 25, 2007, the California Air Resources Board (ARB) approved the SJVUAPCD 2007 PM10 Maintenance Plan and Request for Redesignation, which outlines SJVUAPCD's strategy for attaining the National Ambient Air Quality Standards (NAAQS) for PM10. On September 25, 2008, the U.S. Environmental Protection Agency (USEPA) redesignated the San Joaquin Valley to attainment for the PM10 NAAQS and approved the PM10 Maintenance Plan. The 2008 PM2.5 Plan was adopted April 30, 2008 and presents the SJVUAPCD's strategy for reducing PM2.5 emissions.

In addition, the SJVUAPCD adopted the 2007 Ozone Plan on April 30, 2007. Through this plan, the SJVUAPCD is pursuing a so-called "Fast Track" strategy to meet years in advance the federal 8-hour ozone attainment deadline of 2024. The strategy includes expediting regulations by ARB and USEPA; substantial increases in incentive funding to be used in the Valley; and the implementation of emission-reduction measures (SJVUAPCD).

a) **No Impact.** A project is deemed inconsistent with applicable air quality plans if it would result in population and/or employment growth that exceeds growth estimated in the applicable air quality plans. The Project does not include development of housing or employment centers, and would not induce population or employment growth (see also **Section 2.3.13(a)**). Therefore, the proposed Project would not conflict with or obstruct the implementation of SJVUAPCD air quality plans. Therefore, no impacts would occur.

b) and c) **Less than Significant Impact.** Construction of the proposed Project involves grading, excavation, and use of construction equipment and vehicles for the sludge dewatering facilities and construction of yard piping. Project construction would result in short-term air pollutant emissions from use of construction equipment, earth-moving activities (grading), construction workers' commutes, materials deliveries and short-distance earth and debris hauling (to elsewhere on the RWRF site).

To aid in evaluating potentially significant construction and/or operational impacts of a project, SJVUAPCD has prepared an advisory document, the Guide for Assessing and Mitigating Air Quality Impacts (GAMAQI), which contains standard procedures for addressing air quality in CEQA documents (SJVUAPCD, 2002). The guide was adopted in 1998 and revised in 2002.

GAMAQI presents a three-tiered approach to air quality analysis. The Small Project Analysis Level (SPAL) is first used to screen the project for potentially significant impacts. A project that meets the screening criteria at this level requires no further analysis and air quality impacts of the project may be deemed less than significant. If a project does not meet all the criteria at this screening level, additional screening is recommended at the Cursory Analysis Level and, if warranted, the Full Analysis Level.

The screening criteria for SPAL are as follows:

- Verify project size or trip volume is less than pre-calculated amounts in GAMAQI Table 5-2 or 5-3
- Verify that project is not a source or near a source of hazardous air pollutants or odors
- If demolition or renovation of existing buildings, contact the SJVUAPCD for asbestos requirements
- Mitigate cumulative impacts with measures appropriate for the site

The following text responds to these criteria.

Project size or trip volume. **Table 2-1** below (from GAMAQI Table 5-2), which SJVUAPCD recommends using as part of the initial screening process, shows the volume of trips per day by land use. During construction, the proposed Project would produce up to 50 vehicle trips daily, which would include workers' commutes, materials delivery, debris hauling, and cake hauling off site. Truck trips associated with Project operation would total approximately 11 per day. There are no criteria specifically for wastewater or sludge management facilities; therefore, the Project trips are compared to industrial and institutional criteria. The criterion number for Institutional land uses is 1,707 trips per day and for Industrial land uses is 1,506 trips per day. Therefore, the Project meets the SPAL criterion for vehicle trips.

Table 2-1
Small Project Analysis Level (SPAL) Criteria in Vehicle Trips

Land Use Category	Project Size
Residential Housing	1,453 trips/day
Commercial	1,673 trips/day
Office	1,628 trips/day
Institutional	1,707 trips/day
Industrial	1,506 trips/day

Source: SJVUAPCD, 2002.

Hazardous pollutants or odors. The proposed Project would be located on the site of an existing facility that does not currently emit hazardous air pollutants. Existing treatment chemicals are handled in accordance with legal requirements; proposed chemicals would also be handled in compliance with legal requirements.

Odors are addressed by a stack, a facility that would not change. The installation of the enclosed centrifuges would reduce odor generation by the sludge dewatering facility.

Asbestos requirements. No demolition is proposed under the Project, nor would existing structures be renovated. Windows would be cut through the east wall of the existing dewatering building into the proposed annex; the material is cast concrete from the 1990s and contains no asbestos. Therefore, there would be no asbestos release potential and no necessity to contact SJVUAPCD regarding asbestos requirements.

Mitigation for cumulative impacts. The Project would mitigate for fugitive dust by implementing Best Management Practices (BMPs), such as watering down disturbed areas regularly. However, no cumulative impacts are anticipated—no other simultaneous construction is proposed on the site or in the vicinity.

Given the above analysis, the proposed Project meets the criteria for "Small Project" under the GAMAQI and, as such, no additional analysis is necessary. Impacts on air quality would therefore be less than significant.

Note that SJVUAPCD Regulation VIII Control Measures for Construction Emissions of PM10 applies by law to all construction sites, and is therefore not considered to be mitigation. These required controls are listed below:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized or dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover
- All on-site unpaved road and off-site unpaved access roads shall be effectively stabilized of dust emissions using water of chemical stabilizer/suppressant
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking
- With the demolition so buildings up to six stories in height, all exterior surfaces of the building shall be wetted during demolition
- When materials are transported off-site, all material shall be covered, or effectively wetted to limited visible dust emissions, and least six inches of freeboard space from the top of the container shall be maintained
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. *(The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions.) (Use of blower devices is expressly forbidden.)*
- Following the addition of material to, or the removal of material from, the surface of outdoor storage piles, said piles shall be effective stabilized of fugitive dust emissions utilizing sufficient water of chemical stabilizer/suppressant
- Within urban areas, trackout shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday
- Any site with 150 or more vehicle trips per day shall prevent carryout and trackout

d) **No Impact.** The proposed Project would not expose sensitive receptors to substantial pollutant concentrations since the proposed Project meets the criteria of the SJVUAPCD Small Project Analysis Level and because there are no sensitive receptors (residences, schools, etc.) in the immediate area. The surrounding land use is agricultural and farm residences are sparse. The closest farm/residence is more than 2,000 feet from the proposed facilities, which would be enclosed. Moreover, the construction emissions would be temporary. Therefore, impacts on sensitive receptors would be less than significant.

e) **Less than Significant Impact.** Construction of the proposed Project facilities would require the use of heavy equipment that would generate exhaust pollutants and may create nuisance odors. However, these temporary, construction-related odor impacts would be confined to the immediate vicinity of the equipment.

During operation, the centrifuge centrate and centrifuge cake will discharge emitted gases into the ventilation system leading to the existing vent stack. In addition, since the new centrifuges would be totally enclosed, the amount of odor that could escape would be substantially less than that of the existing belt filter presses, which are not enclosed. The

proposed cake pumping would have no exposed sludge surface and consequently little fugitive odor emission. The less frequent use of the existing open-belt conveyors would also reduce odor emissions. The addition of the second silo may be a source of additional odor; however, it is anticipated that the increase would be minor and limited to the immediate vicinity of the silo, as with the present silo.

Overall, the Project would result in a decrease in foul air fugitive emissions due to the centrifuge dewatering, plus cake pumping. Using the free surface of sludge exposed as an estimate, the new dewatering system would have approximately 90 percent less odor-emitting surface than the existing dewatering system. Given the above, impacts from the creation of objectionable odors affecting a substantial number of people would be less than significant.

2.3.4 Biological Resources

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion:

Results of a CDFG Natural Diversity Data Base (NDDB) search for the Kearney Park USGS quadrangle indicated two sensitive species: burrowing owl (*Athene cunicularia*) (California species of special concern) and Fresno kangaroo rat (*Dipodomys nitratoides exilis)* (federal and state Endangered species). Current distribution studies indicate the Fresno kangaroo rat is no longer present in Fresno County (California State University, Stanislaus, 2008). The burrowing owl is known from the RWRF in and on the percolation pond berms (Fresno Audubon Society, 2009).

The RWRF site is comprised of treatment facilities on land that is paved or graded in the northeast corner of an approximately 2,400-acre site. The great majority of the site is comprised of 101 open percolation basins included in the National Wetland Inventory (EDR, 2010). The proposed sludge dewatering facilities would be located less than one acre immediately adjacent to existing treatment facilities on land that is currently paved or bare earth currently being used as a construction staging area for a separate project at the RWRF.

A field survey of the proposed facilities sites for the presence of burrowing owls and active burrowing owl burrows was performed on March 17, 2010 at approximately noon. No burrowing owls were observed. A road east of the existing dewatering building and east of the road proposed for repaving to handle sludge trucks is currently gravel paved or graded earth. The mouths of approximately 8 animal burrows were identified adjacent to the road, typically near existing light poles. Potential burrow occupants are gophers, ground squirrels and burrowing owls (RWRF operations staff, pers. comm. to Janet Fahey, MWH, 2010). Because of recent rain, materials such as feathers that would have accumulated at the mouths of the burrows and help identify the occupants, had been washed back inside and were no longer visible.

No biological habitat is present on the paved facilities' sites. The percolation ponds are heavily used by migratory birds and waterfowl, but the construction would be a least a quarter mile from the nearest pond.

a) **Less Than Significant Impact with Mitigation Incorporated.** The dewatering facilities would be constructed on a previously disturbed site characterized by blacktop-paved ground or cleared ground within an existing RWRF. As such, no vegetation clearing would be required to construct the facilities. The closest pond is approximately a quarter mile to the southwest on the other side of existing treatment facilities. Therefore, impacts on nesting birds from construction noise would be less than significant. No impact on Fresno kangaroo rat would occur, since the species is no longer present in Fresno County. However, animal burrows were found in the proposed roadway repaving and widening area, and it is possible that burrowing owls and active burrows may occur here. Therefore, the impact on sensitive species is potentially significant unless mitigated. Mitigation that will reduce impacts to a level of less than significant is described in mitigation measure BI-1 below.

b) **No Impact**. The proposed dewatering facilities would be located on a paved area or graded area adjacent to the existing dewatering building. The yard piping would be buried. The proposed Project site contains no riparian formations or any other sensitive habitats.

Therefore, there would be no impact on any riparian habitat or any other sensitive natural community.

c) **No Impact**. There are no wetlands on the Dewatering Facilities Upgrade sites (MWH site visit March 17, 2010). The facilities sites are paved or cleared earth. Therefore, there would be no impact on wetlands.

d) **No Impact.** The proposed Project would not affect the movement of wildlife, since the yard piping would be buried and the dewatering facilities would be constructed on a paved or graded site. There are no wildlife nursery sites within the proposed Project site. Therefore, there would be no impacts on wildlife movement.

e) **No Impact.** The proposed site is paved or graded and adjacent to the existing facilities within the treatment plant boundary. Therefore, no impact would occur relative to local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) **No Impact.** The proposed Project facilities site is not currently located within the boundaries of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or a designated Significant Ecological Area. Therefore, the proposed Project actions would not conflict with an adopted habitat plan.

Mitigation Measure

BI-1 To mitigate for potential impacts on burrowing owls along the roadway to be widened and paved, the following actions shall be incorporated into the project specifications:

1. A preconstruction survey shall be conducted by a qualified biologist to examine potential burrows on the project site for the existence of burrowing owl. The survey shall be conducted within 30 days prior to any construction activities within 50 feet of the roadway to be repaved. Results of the preconstruction survey shall be prepared in a letter and given to the California Department of Fish and Game (CDFG) for their review and approval prior to any construction activities at the roadway.
2. If burrowing owl or active burrow is found, the CDFG 1995 guidelines, "Staff Report on Burrowing Owl Mitigation," shall be consulted and the City shall select one of the following measures for implementation by a qualified biologist:
    a. Destroy vacant burrows prior to March 1 and/or after August 31
    b. Redesign (reschedule) the roadway repaving project element temporarily or permanently to avoid occupied burrows or nest sites until after the nesting/fledging season (March 1 through August 31)
    c. Delay the roadway repaving project until after the nesting/fledging season
    d. Install artificial burrows in open space areas of the project site and wait for passive relocation of the burrowing owl
    e. Active relocation of the burrowing owl with conditions. The City shall fund relocation of burrowing owl to unoccupied, suitable habitat that is permanently preserved (up to 6.5 acres per nesting pair) at a recognized burrowing owl mitigation bank.

2.3.5 Cultural Resources

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

Discussion:

The proposed dewatering facility and yard piping would be sited in paved or other previously disturbed areas. However, the footing for the silo would require excavation approximately 10 feet below ground surface.

A cultural resources inventory has been prepared to support the Project. The investigation involved a records search and background review, Native American consultation, and a pedestrian survey of Project construction areas. A records search compiled by the Southern San Joaquin Valley Information Center (SSJVIC) at California State University, Bakersfield indicated no sites within a one-mile radius of the Project area. None of these studies included any portion of the Project site. SSJVIC records search data indicate no resources within one mile of the Project site; however, the archaeological site is not located within the Project area. One additional historic resource was recorded within one mile of the Project site, but the resource is not located within the Project area. The SJVIC further reports that review of files at the National Register of Historic Places, California Historical Landmarks, and California Register of Historic Resources reveals no cultural resources within one mile of the Project site.

A review by the Native American Heritage Commission (NAHC) of the Sacred Lands File database failed to reveal any cultural resources within or directly adjacent to the Project area. Direct contacts and consultation with Native American representatives recommended by the NAHC were made. Letters informing NAHC-listed contacts about the proposed Project were sent. Comments about the project were solicited. To date, the tribes either have not responded or indicated that they had no interest in the site.

Based on a Paleontological Information Report (PIR) prepared for the project, which also involved literature review, a record search and on-foot survey, there is a "moderate" possibility that paleontological resources may be present in sediment beginning 2 feet below ground surface. The conditions would apply to the foundation for the new silo, which would be excavated to approximately 10 feet below ground surface. The balance of the site disturbance has a "low" probability of encountering fossils.

a) **No Impact.** The Cultural Resources Inventory for the Project identified no structures of historic age within one mile of the Project site. Since there are no historic resources on the proposed site, Project construction would not cause a substantial adverse change in the significance of a historical resource. Accordingly, no impact to historical resources would occur.

b) **Less Than Significant Impact.** As discussed above, no archaeological sites are located within the Project site. Based on a review of existing records and the disturbed nature of the Project site, no significant archaeological resources are expected to be encountered at the proposed site; therefore, archaeological monitoring is not warranted. The study found no cultural resources or any definitive evidence that such resources would be exposed during construction. Based on the findings and assessment, no further investigation is recommended. Impacts would therefore be less than significant. Nonetheless, mitigation measure CUL-1 would be incorporated into Project plans and specifications to address the presence of unknown subsurface resources encountered during site grading.

c) **Less than Significant Impact with Mitigation Incorporated.** The Project site is a previously disturbed area in a within the RWRF boundary. There are no unique geologic features in the Project area, which is underlain by flat alluvial deposits characteristic of the San Joaquin Valley floor. Therefore, there would be no impact on unique geologic features.

A PIR was prepared for the Project and comprised geologic, paleontologic, and legal literature from: 1) California State University-Fresno, 2) City and County of Fresno, and 3) California Department of Transportation (Caltrans) District 11 office. A paleontological records search was also requested from the Los Angeles County Museum of Natural History. From the site visit, literature review and record search results, it was concluded that the site‘s uppermost 3-4 ft consists of fill and highly disturbed Holocene alluvial soil that is considered to have “Low Sensitivity” for fossils. However, the deeper excavation for the new silo to 10 feet bgs could potentially uncover significant fossil vertebrates of the Modesto Formation; it is considered to have “Moderate Sensitivity.” Therefore, site excavation for the silo will be monitored by a qualified professional having the authority to halt further work until assessment and/or appropriate salvage of any fossils is undertaken. Preparation of a paleontological monitoring plan was found not to be necessary. Therefore, the impact would be less than significant with mitigation. See Mitigation Measures CUL-2 and CUL-3 below.

d) **No Impact.** Human remains are not known or expected at the Project site based on past site development; as such, no impact is anticipated. Mitigation Measure CUL-4 will be included in project specifications to address unforeseen impacts.

Mitigation Measures:

CUL-1: The Project specifications shall state that if previously unidentified and potentially significant archaeological resources (e.g., stone artifacts, dark ashy soils or burned rocks, or old glass, metal, or ceramic artifacts) become apparent during ground disturbances, work in that

location shall be diverted and a qualified archaeologist shall be contacted immediately to evaluate the nature and significance of the find.

CUL-2: Before construction-related earthmoving activities and excavation at depths of 2 feet below the surface (into the Modesto Formation), the services of a qualified Principal Paleontologist shall be retained and consulted.

CUL-3: Consistent with Federal and State law, if fossils are discovered during excavation of the silo site, an approved Principal Paleontologist must be called to the site to develop mitigation measures to protect those resources. Based on the information in the PIR prepared for the Project, the Paleontologist shall determine when and where monitoring will be required, and who will conduct it.

The Paleontologist shall coordinate with appropriate construction contractor personnel to provide information regarding applicable requirements concerning protecting paleontological resources. Contractor personnel, particularly heavy-equipment operators, shall also be briefed on procedures to be followed in the event that fossil remains and a currently unrecorded fossil site are encountered by earthmoving activities if a paleontological construction monitor is not on the site. Additional briefing shall be presented to new contractor personnel as necessary. Names and telephone numbers of the monitor and other appropriate mitigation program personnel shall be provided to appropriate contractor personnel.

When required, monitoring shall consist of visually inspecting freshly exposed cuts into the Modesto Formation, and spoil piles for the discovery and recovery of larger fossil remains, and periodically dry test screening to allow for the discovery and recovery of smaller fossil remains. If larger vertebrate fossils are noted by construction workers or monitors, excavation there will cease, and the monitor will be notified. The monitors will then notify the Principal Paleontologist.

The monitor and recovery staff will salvage all larger vertebrate fossil remains, as soon as practicable and as quickly as possible, under the supervision of the Principal Paleontologist following Society of Vertebrate Paleontology (1995) and State (Caltrans, 2007) guidelines. The monitor shall document the location and proper geologic context of any recovered fossil occurrence or rock or sediment samples. Any recovered rock or sediment sample from the Modesto Formation shall be processed to allow for the recovery of smaller fossil remains that normally are too small to be observed by the monitor. Pursuant to Society of Vertebrate Paleontology (1995) standard measures, no more than 6,000 pounds (12,000 pounds total) of sediment need be processed from the Modesto Formation.

If the Paleontologist or monitor determines that the fossil site is too unproductive or the fossil remains not worthy of recovery by the monitor, no further action will be taken to preserve the fossil site or remains, and earthmoving activities shall be allowed to proceed through the site immediately.

All fossil specimens recovered from the Project site as a result of mitigation, including those recovered as the result of processing rock or sediment samples, will be treated (i.e., prepared,

identified, curated, catalogued) in accordance with designated museum repository requirements. Rock or sediment samples will be submitted to commercial laboratories for microfossil, pollen, radiometric dating, or other analysis, as appropriate.

The monitor shall maintain daily monitoring logs that include the particular tasks accomplished, the earthmoving activity monitored, the location where monitoring was conducted, the rock unit(s) encountered, the fossil specimens recovered, and associated specimen data and corresponding geologic and geographic site data. A final technical report of results and findings shall be prepared by the Paleontologist in accordance with any City requirement and archived at a repository mutually approved by the City and Paleontologist.

CUL-4: If human remains are uncovered, or in any other case when human remains are discovered during construction, the Fresno County Coroner is to be notified to arrange their proper treatment and disposition. If the remains are identified—on the basis of archaeological context, age, cultural associations, or biological traits—as those of a Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will determine the manner in which the remains are treated.

2.3.6 Geology and Soils

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial risks to life or property?	☐	☐	☒	☐

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems, where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Discussion:

a)-i) **Less Than Significant Impact.** There are no defined Alquist-Priolo Special Fault Study zones in the Fresno County Metropolitan Area (FCMA) (Fresno General Plan Draft MEIR, 2002); as such, the proposed Project site is not located within an area identified as an Alquist-Priolo Earthquake Fault Zone. In addition, no active faults have been identified in the FCMA. Nonetheless, the proposed facilities could be affected by seismic events produced by active fault systems in other regions of California and are therefore subject to ground shaking and potential damage during a seismic event. The dewatering facilities and yard piping would be designed to meet current California building standards to withstand seismic ground shaking. Therefore, a less than significant impact relative to fault rupture would occur.

a)-ii) **Less than Significant Impact.** As with most of California, the proposed facilities would be subject to ground shaking and potential damage during a seismic event. However, the proposed Project does not involve construction of habitable structures and the facilities would be designed to meet current California building standards to withstand seismic ground shaking. Therefore, Project impacts related to seismic ground shaking would be less than significant.

a)-iii) **Less than Significant Impact.** Liquefaction is a process by which sediments below the water table temporarily lose strength and behave as a liquid rather than a solid. In the liquefied condition, soil may deform enough to cause damage to buildings and other structures. Seismic shaking is the most common cause of liquefaction. Liquefaction occurs in loose sands and silts in areas with high groundwater levels. Liquefaction has been most abundant in areas where groundwater occurs within 30 feet of the ground surface (EERI, 1994). Where groundwater levels are greater than 50 feet deep, surface damage from deeper liquefaction generally will not occur.

The risk of liquefaction in the Project area is considered low due to Fresno's well-drained alluvial soil (City of Fresno, 2002). Therefore, impacts relative to liquefaction would be less than significant.

a)-iv) **Less than Significant Impact.** The Project site is located in an area of flat terrain and there are no hills or mountainous areas located in the Project vicinity, precluding the risk of landslide. In addition, the Fresno General Plan Draft Master EIR (2002) considers landslide occurrence in Fresno "unlikely" due to its flat topography. Therefore, the proposed Project would have less than significant impacts related to landslides.

b) **Less than Significant Impact.** During Project construction, onsite soils would be temporarily prone to erosion, especially during winds and rains. Therefore, effects on soil erosion would be limited to temporary construction impacts, and would be less than significant with implementation of BMPs in the plant's SWPPP.

c) **Less Than Significant Impact.** As described above in a)-iii) and a)-iv), liquefaction and landslide are not considered to be a significant potential hazard for the Project site. The Project plans and specifications will comply with the Uniform Building Code (UBC) and recommendations of the Project's geotechnical report (to be prepared during detailed design), as applicable. Therefore, impacts relative to unstable soils conditions would be less than significant.

d) **Less than Significant Impact.** Expansive soils expand and contract due to changes in moisture content and are generally high in clay content. The expansion and contraction of soils can result in differential movement beneath building foundations and can cause structural damage, including cracking in walls or foundations, uneven floors, and destabilization.

The U.S. Soil Conservation Service's map of Soils of Eastern Fresno County indicates that expansive soils are present in much of the Fresno Sphere of Influence (SOI) (Fresno, 2002). In some of these areas, there are highly erodible soils present. Project plans and specifications will comply with the UBC and recommendations of the Project's geotechnical report, as applicable. Furthermore, the proposed Project does not involve construction of habitable structures. Therefore, impacts related to expansive soils would be less than significant.

e) **No Impact.** No septic tanks or alternative wastewater disposal systems would be required for the proposed Project. Therefore, no impacts would occur.

2.3.7 Greenhouse Gas Emissions

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion:

Assembly Bill (AB) 32, the California Global Warming Act of 2006, requires California to reduce its greenhouse gas emissions (GHG) to 1990 levels by 2020, which is nearly a 30 percent cut from "business-as-usual" emission levels projected for 2020, or about a 15 percent cut from today's emission levels. A central element of AB32 is preparation of a Scoping Plan to achieve these goals. Emissions from operations of various economic and public sectors are discussed in the Act. GHG emission reductions from the water sector are not currently counted toward the 2020 goal.

On September 30, 2008, Governor Arnold Schwarzenegger signed Senate Bill (SB) 375, which seeks to reduce GHG emissions by discouraging sprawl development and dependence on car travel. SB 375 helps implement the AB 32 GHG reduction goals by integrating land use, regional transportation and housing planning. SB 375 does not apply directly to water supply or wastewater facilities planning. In addition, SB 375 Implementation Schedule, which anticipates final GHG targets from the State Air Resources Board in September 2010, targets reducing vehicles miles traveled (VMT) to reduce GHG.

AB32 GHG Reduction Goals. The AB 32 2020 GHG reduction goals do not at present include the water sector (which includes the proposed Project), but the water sector is included in the Scoping Plan. The CARB adopted its Climate Change Scoping Plan pursuant to AB 32 on December 12, 2008. The Scoping Plan contains six GHG reduction measures proposed for the water sector summarized as "continue efficiency programs and use cleaner energy sources to move and treat water."

W-1	Water Use Efficiency
W-2	Water Recycling
W-3	Water System Energy Efficiency
W-4	Reuse Urban Runoff
W-5	Increase Renewable Energy Production
W-6	Public Goods Charge

Three of these measures target reducing energy requirements and two measures aim at reducing the amount of non-renewable electricity associated with conveying and treating water. The sixth measure focuses on sustainable funding for implementing these actions. The public goods charge is proposed to be collected on water bills and used to fund water efficiency improvements, water recycling, and the like. The GHG emission reductions from these measures are realized indirectly through reduced energy requirements and are accounted for in the Electricity and Natural Gas sector.

The checklist questions above reflect the contents of CEQA Guidelines Section 15064.4. Section 15064.4(a) states that the lead agency should make a good faith effort to describe, calculate or estimate the amount of GHG emissions resulting from a project. The lead agency has discretion to determine whether to:

1) Use a model or methodology to quantify GHG emissions from a project and which method or methodology to use; or
2) Rely on a qualitative analysis or performance based standards.

CEQA Guidelines section 15064.4(b) states that a lead agency should consider the following factors when assessing the significance of GHG emissions on the environment:

1) The extent to which the project may increase or reduce GHG emissions when compared to the existing environmental setting
2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project
3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional or local plan for reduction or mitigation of GHG emissions.

San Joaquin Valley Air Pollution Control District. The Project site is located within the boundaries of the San Joaquin Valley Air Pollution Control District (SJVAPCD), which adopted: *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* and the policy: *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS) to assess significance of project specific greenhouse gas emissions on global climate change during the environmental review process, as required by CEQA. Use of BPS is a method of streamlining the CEQA process of determining significance and is not a required emission reduction measure. Projects implementing BPS would be determined by SJVAPCD to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact.

No significance thresholds for GHG emissions have adopted. Interim thresholds have been identified for several air districts. SJVAPCD, in response to comments on a dairy project submitted by the Attorney general's Office, identified a significance threshold of 38,477 metric tons (MT) of carbon dioxide equivalent per year (CO2e/yr). However, the air district currently has no plans to formally adopt this significance threshold (SCAQMD, 2008).

Interim Significance Thresholds – Other Air Districts

SCAQMD. On December 5, 2008, the South Coast Air Quality Management District (SCAQMD) adopted an interim GHG significance threshold for industrial (stationary source) projects where SCAQMD is the lead agency. A project is considered to have an economic life of 30 years. Based on the CAPCOA Significance Threshold, a project is considered less than significant if greenhouse gas emissions, including construction impacts amortized over 30 years, show an incremental increase below 10,000 MTCO2e/year.

BAAQMD. The Bay Area Air Quality Management District, California Environmental Quality Act Guidelines Update, Proposed Thresholds of Significance were published on November 2, 2009, and also proposed 1,100 MT per year of CO2e for stationary source projects.

Project GHG Emissions

Construction. Total construction emissions of NOx, CO2 and CH4 have been estimated and converted to MT CO2e (see Appendix). The total for the 18-month construction period is approximately10,210 MT. Over the first 12 months, the total emissions would be 6,708 MT. If amortized over 30 years, the annual CO2e construction emission would be 340 MT CO2e per year.

Operations. For PG&E electricity, the conversion is 0.49 lb CO2e per kWh (Stop Waste, 2010). Thus, an increase in electricity use of 930,000 kWh/yr for the sludge dewatering project would represent approximately 207 MT.

a) **Less Than Significant.** The direct Project GHG emissions would be primarily from construction equipment and vehicles and operation equipment and vehicles.

Operations. One source of direct operation emissions would be from truck trips to haul dewatered sludge off site. As discussed in **Section 1.4.3**, the Project would reduce cake transport from 289 wet tons per day to 212 wet tons per day, which would reduce off-site transport of cake from 14-15 truckloads per day to 10-11 truckloads per day. This reduction in truck trips would result in a reduction in local GHG emissions, a benefit.

Sludge dewatering facilities would be in enclosed buildings with vents. The replacement of belt presses with centrifuges is anticipated to reduce not only odor, but emissions of volatile organic carbons (VOC) by over 90 percent. This would also be an environmental benefit, but difficult to quantify, since no measurement of existing VOCs has been made.

Indirect GHG emissions with operation would be created by additional electrical energy use for sludge dewatering using centrifuges. The electricity would be supplied by PG&E, which provides electric and gas power to 40 percent of California. PG&E provides its customers with electricity that has a CO2 equivalent emissions rate that is at least 50 percent below the national average among utilities. PG&E is a member of the Sulfur Hexafluoride (SF6) Emission Reduction Partnership, which focuses on reducing emissions of SF6 (approximately 23,900 times as potent as CO_2 on a per ton basis) from transmission and distribution operations. PG&E has implemented a number of programs to reduce GHG emissions by delivering cleaner electric power to customers; investing in renewable energy; and supporting customer education and energy-efficient programs, including forest conservation and the capture of methane gas from dairy farms and landfills. PG&E has also partnered with counties, agencies and cities, including Fresno, to install energy-efficient equipment and reduce energy use. Each of these "Energy Watch" programs is unique to the needs of the local area.

Under the Project, electrical consumption at the Plant would increase by 930,000 kWh over 2009 power use. This amount is not reducible, but is considered to be a less than significant contributor to GHG emissions by PG&E facilities, which themselves minimize their

emissions. Accordingly, direct and indirect impacts relative to GHG emissions for both construction and operation of the Project are considered to be less than significant.

Construction. Total construction emissions have been estimated for all phases of construction over the anticipated 18-month period (see Appendix). The estimated maximum GHG construction emission during a 12-month period is approximately 6,807 MT CO2e, which is below the interim one-year threshold for SJVAPCD and SCAQMD. If the construction emissions are amortized over 30 years, suggested by California Air Pollution Control Officers Association (CAPCOA) and SCAQMD, the annual emissions would be 340 MT CO2e. These figures are below interim thresholds and are therefore considered to be less than significant.

b) **Less than Significant**. The proposed Project would use the minimum amount of energy and vehicles required to construct the new silo, dewatering facility, road improvements, and associated yard piping.

With respect to operation, since no additional staff would be required for system operation and vehicles miles traveled for sludge hauling would decrease by 27-29 percent; Project-related VMT effects would be less than significant. Therefore, the project would not conflict with SB 375.

Given the above, the Project effect on plans, policies or regulations to reduce GHG would be less than significant.

2.3.8 Hazards and Hazardous Materials

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the	☐	☐	☐	☒

	Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
	project result in a safety hazard for people residing or working in the project area?				
f)	For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h)	Expose people or structures to the risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion:

The Fresno County Department of Environmental Health is the relevant Certified Unified Program Agency (CUPA) that administers programs regulating hazardous materials and hazardous waste in the County. Storage of hazardous material above a certain amount is under the jurisdiction of the Fresno County Environmental Health Division, which administers the California Accidental Release Prevention (CalARP) Program. The Program regulates businesses that store Extremely Hazardous Substances above specified quantities. These chemicals and quantities are found in Title 19 of the California Code of Regulations. The fees are related to the different Program Level the business is assigned to and covers the regulatory administrative and inspection costs.

A portion of an existing area to be paved is underlain by past deposition of sewage material. The asphalt to be removed in this area is considered to be contaminated and would not be stockpiled for future recycling and reuse on city projects.

a) and b) **Less than Significant Impact.** The proposed Project includes construction and operation of a Dewatering Facility Upgrade, yard piping and improved road. Fuels would be used by vehicles and heavy equipment during construction and maintenance. There would be no change from existing level of hazard from fuel use. As discussed in **Section 1.4.3**, proposed facilities would include additional chemical storage and handling for polymer and ferric chloride. Polymer would be stored in a new tank that would be constructed off the existing main dewatering building and additional ferric chloride would be stored in the plant's existing chemical storage facilities. Both chemicals, which are currently used on site, would continue to be transported, stored and handled on site in accordance with applicable regulations. Therefore, the Project would not create a significant hazard to the public or the environment from use, transport, or disposal of hazardous materials, and impacts would therefore be less than significant.

c) **Less Than Significant Impact.** The Project would involve the use of fuels for vehicles and heavy equipment (during construction and maintenance), as well as polymer and ferric chloride. However, the proposed Project site is not located within one-quarter mile of existing or proposed schools. Therefore, a less than significant impact would occur.

d) **Less Than Significant.** Section 65962.5 of the California Government Code requires the California Environmental Protection Agency (CalEPA) to update a list of known hazardous materials sites, which is also called the "Cortese List." The sites on the Cortese List are designated by the State Water Resources Control Board, the Integrated Waste Management Board, and the Department of Toxic Substances Control.

A records search of the Cortese List was conducted for the Project site area for the Dewatering Facility Upgrade site on March 2, 2010 (EDR, 2010). The records search meets the requirements of the American Society for Testing and Materials Standard Practice for Environmental Site Assessments. The Project site and areas within a half-mile radius are not listed as containing hazardous materials. Given the above, impacts relating to the potential to encounter hazardous materials would be less than significant. Mitigation Measure HAZ-1 shall be incorporated into project specifications to further reduce impacts.

e) and f) **No Impact.** The proposed Project site is not located within an airport land use plan, and is not located within two miles of a public/public use airport or a private airstrip. Fresno Chandler Executive Airport is approximately 4 miles to the northeast. Therefore, no impacts would occur. Implementation of the proposed Project would therefore have no impact related to airport land use plans or public/public use airports.

g) **Less Than Significant Impact.** Due to the small number of materials trips and workers' commutes, Project construction is not expected to interfere with emergency response, and no road closures would occur. Notwithstanding, emergency service providers would be notified prior to construction of the location, timing, and duration of the Project. As such, impacts would result in a less than significant level relative to adopted emergency response plans or emergency evacuation plans.

h) **No Impact.** The proposed Project involves construction of a sludge dewatering facility upgrade, construction of yard piping and improved paving on a section of road. The proposed Project would not involve construction of housing or other habitable structures and would be within the boundaries of an existing RWRF on a paved or previously graded site. The RWRF is surrounded by agriculture. In addition, the Project site is not located in a wildfire hazard zone (California Department of Forestry and Fire Protection, 2000). Therefore, the proposed Project would have no impact related to an increase in the risk of damage from wildland fires.

2.3.9 Hydrology and Water Quality

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☒	☐
j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?	☐	☐	☒	☐

Discussion:

The Project site is within the jurisdiction of the California Regional Water Quality Control Board Central Valley Region (5F, Tulare Lake Basin) (Regional Board). Designated beneficial uses for ground waters and water quality objectives are contained in the Water Quality Control Plan

(Basin Plan) for the Regional Water Quality Control Board Central Valley Region (Regional Board, 1995; revised 2004).

There are no surface waters in the vicinity of the RWRF and all site runoff is collected and pumped to the RWRF headworks; there is no surface discharge. Therefore, the discussion in this section focuses on groundwaters.

Designated beneficial uses for Basin groundwaters (Kings River Hydrographic Unit) are municipal and domestic supply (MUN); agricultural supply (AGR); industrial service supply (IND); industrial process supply (PRO); water contact recreation (REC-1); and non-water contract recreation (REC-2) (Regional Board, 2004).

The Basin Plan sets water quality objectives for the Tulare Lake Basin to protect beneficial uses. No numerical objectives have been set for the basin. Narrative objectives for groundwater have been established for bacteria, chemical constituents, pesticides, radioactivity, salinity, tastes and odors, and toxicity (Regional Board, 2004). With respect to salinity, the Basin Plan states that "no proven means exist at present that will allow ongoing human activity in the Basin and maintain groundwater salinity at current levels throughout the Basin. Accordingly, the water quality objectives for ground water salinity control the rate of increase." For the Kings River Hydrographic Unit, the maximum average annual increase in electrical conductivity shall not exceed 4 µmhos/cm (Regional Board, 2004).

The Project site overlies a recharge area of the Fresno aquifer, a designated "sole source" aquifer (USEPA, 2002). The U.S. Environmental Protection Agency will designate a sole source aquifer as such if it is the only (or the principal) drinking water source for an area and that, if contaminated, could create a public health hazard (Basin Plan, 2004).

a) **Less than Significant Impact.** The construction and operation of the proposed dewatering facilities would have a less than significant impact on surface or water quality. Under the facility's current Regional Board permit, the City would need to revise the Unit Process Descriptions prior to construction. No construction site dewatering is anticipated. Currently, site runoff is collected and conveyed to the RWRF headworks, an arrangement that would continue with construction and operation of the sludge dewatering facilities. Permits for disposal of the sludges to land would not need to change, since the disposal location and sludge quality would be unchanged. As such, impacts relative to water quality standards or waste discharge requirements would be less than significant.

b) **Less than Significant Impact.** As discussed above, the Project site overlies the Fresno sole source aquifer. While the site is mostly paved, Project construction would increase impermeable surfaces by approximately 2,500 square feet (0.06 acres), thereby decreasing potential ground water recharge area minimally. The proposed Project does not involve groundwater extraction, nor would it have any impact on beneficial uses or objectives for groundwater as delineated in the Basin Plan. Further, the Project would have no effect on surface water resources; runoff from the Project site would continue to be collected and conveyed to the RWRF headworks. Therefore, the impact would be less than significant.

c), d) and e) **Less than Significant Impact**. Runoff from the Project site is currently collected and conveyed to the RWRF headworks. The proposed Project construction would involve minor earthwork for the sludge dewatering facilities upgrade site and yard piping. Existing grades would be preserved, and earthwork would not change runoff characteristics. Project implementation would not result in substantial erosion or siltation, flooding, or provide additional sources of polluted runoff. Therefore, impacts would be less than significant.

f) **Less Than Significant Impact**. During construction of the proposed facilities, stormwater would be managed in accordance with BMPs for the existing RWRF and a new SWPPP, since the total site disturbance would be greater than 1 acre. The impact would be less than significant.

g) **No Impact.** The proposed Project does not include housing and the project vicinity is not within a 100-year flood zone per Federal Emergency Management Agency (FEMA) mapping (FEMA, 2009). Therefore, there would be no Project-related impacts on housing within a 100-year flood hazard area.

h) **Less than Significant Impact.** The facilities site is not located within a 100-year flood hazard area, per FEMA mapping (FEMA, 2009). Therefore, the sludge dewatering facilities would not significantly impede or redirect 100-year flood flows. The yard piping would be buried. Therefore, the impact would be less than significant.

i) **Less than Significant Impact.** Impacts related to exposure of people or structures to risk of loss, injury or death involving flooding would be less than significant. The yard piping would be buried. The dewatering facilities would meet UBC requirements for construction in seismically active areas and would contain solids rather than liquids that could cause localized flooding. Therefore, the impact would be less than significant.

j) **Less than Significant Impact.** The Project sites are inland and therefore not subject to damage from a tsunami (seismic sea wave). The proposed Project does not involve construction of housing or other habitable structures. In addition, mudflows are not known for the Project area. In addition, the Project facilities would not store liquids that could create seiches (standing seismic waves) that could damage structures. Therefore, impacts would be less than significant relative to risk of loss, injury or death involving inundation by seiche.

2.3.10 Land Use and Planning

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an	☐	☐	☐	☒

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
environmental effect?				
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion:

a) **No Impact.** The proposed Project comprises a sludge dewatering facility upgrade and yard piping. The Project would be constructed in a paved or graded area within the boundaries of a wastewater treatment plant. The yard piping would be buried and also within the RWRF boundaries. Surrounding land use is agriculture. As such, the Project would not divide an established community. Therefore, there would be no impact.

b) **No Impact.** The proposed Project would be within the boundaries of an existing wastewater treatment plant. There would be no permanent changes in land use as a result of Project implementation. The zoning and land use designations of the proposed sites would not be affected by the construction of the proposed Project. Therefore, there would be no conflict with any land use policy adopted for the purpose of mitigating an environmental effect. Therefore, no impacts would occur.

c) **No Impact.** See **Section 2.3.4(f).** There are no adopted conservation plans relevant to the Project area.

2.3.11 Mineral Resources

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

Discussion:

a) and b) **No Impact.** Aggregate materials along the San Joaquin River corridor are the principal mineral resources in Fresno; additional resources are located along the Kings River corridor and several streambeds in the western portion of Fresno County. Resources are surface mined. The California Department of Conservation, Division of Mines and Geology, maps aggregate deposits and has designated the Fresno Metropolitan Area and most of eastern Fresno County as a production-consumption region for mineral resources (Fresno General Plan Draft MEIR, 2002). However, the Project site and

immediate vicinity are not mapped on the most recent Aggregate Mineral Resource Zones Map in the City's planning area (Fresno General Plan [Exhibit 10], 2002). Therefore, no impact on mineral resources would occur.

2.3.12 Noise

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion:

Noise impacts would be site-specific. Construction noise could temporarily affect sensitive noise receptors, such as nearby farms with residences. Operation noise would be limited to dewatering facility operation (within an enclosed structure) and occasional maintenance vehicles; the yard piping would be buried and therefore inaudible.

The proposed Project would be located in the City of Fresno. The City of Fresno Municipal Code Section 9-2701 regulates noise. Acceptable noise levels are tabulated below. No noise levels requirements are shown for agricultural areas. Exempt from the provisions of the Fresno noise ordinance are construction, repair or remodeling work accomplished pursuant to a building, electrical, plumbing, mechanical, or other construction permit issued by the city or other governmental agency, or to site preparation and grading, provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday. Since the project is a City project, it is assumed that the construction would be exempt from the City Noise Ordinance.

Acceptable Noise Levels for Land Use Categories

DISTRICT	TIME	SOUND LEVEL DECIBELS
Residential	10 pm to 7 am	50
Residential	7 pm to 10 pm	55
Residential	7 am to 7 pm	60
Commercial	10 pm to 7 am	60
Commercial	7 am to 10 pm	65
Industrial	anytime	70

Source: City of Fresno.

a) and d) **Less than Significant.** This section discusses construction and operation noise created by the proposed Project.

Construction Noise. Noise levels generated by earth-moving equipment range from 73 to 95 dBA (decibels, A-weighted scale) at 50 feet from the source (Bolt, Beranek, and Newman, 1971). Based on a characterization of composite construction noise by Bolt, Beranek, and Newman (1971), it is anticipated that Project-related construction activities would generate noise levels of approximately 88 dBA Leq at 50 feet [Leq stands for equivalent noise level, which is a measurement of the sound energy level averaged over a specified time period (usually one hour)]. With construction, there would also be substantial temporary or periodic increases in ambient noise levels in the Project vicinity above levels existing without the Project.

The surrounding area is agricultural; the City Noise Ordinance has established no noise requirements for agricultural land uses. Project construction would be located approximately 2,000 feet from the nearest farm residence property boundary.

During Project construction, exterior noise levels at this closest residence would be approximately 55 dBA, which would be less than significant. The noise sources associated with construction of a City project are assumed to be exempt from the Noise Ordinance, provided these activities occur between 7 a.m. and 10:00 p.m. on any day except Sunday. Project specifications therefore will require that construction of all facilities be limited to the workdays and hours identified in the City Noise Ordinance. No other noise mitigation is anticipated for construction. As such, construction noise impact would be less than significant.

Operation Noise. In the new sludge dewatering building, noise from each of the three centrifuges may result in noise levels up to 85 dB at three feet (specified limit). The additive noise level is assumed to reach 88 dB (Canter, 1977). The annex and silo would be constructed of cast in place concrete, painted, which is anticipated to reduce noise measured at the immediate exterior by 20 percent or to approximately 70 dB (NRC Ratings, 2010). The noise at the RWRF boundary closest to the new facilities, approximately 660 feet to the east, would not be discernible. During Project operation, the Project would not generate

substantial noise because the facilities would be within an enclosed building. Operators would only be in the building sporadically and could wear ear protectors. Therefore, the impact of operation on operations staff and neighboring properties would be less than significant.

b) **Less than Significant Impact.** Project construction may involve the temporary use of equipment that would generate groundborne vibration or groundborne noise levels. While the effects may be sensed at the property boundary of the RWRF, noise would be intermittent and temporary and there are no sensitive receptors at the property boundary. Therefore, impacts would be less than significant.

c) **Less than Significant Impact.** Operation of the sludge dewatering facilities would result in generation of noise from the pump motors; however, the building would be designed so that noise produced by the motors would meet City noise standards. Operation of the yard piping would not create noise except for infrequent maintenance activities. Therefore, operational noise impacts would be less than significant.

e) and f) **No Impact**. The proposed Project site is not located within an airport land use plan, and is not located within 2 miles of a public/public-use airport or a private airstrip. Therefore, no impacts would occur.

2.3.13 Population and Housing

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion: The project contains no housing and supports no additional population or employment during Project operation.

a) **Less Than Significant Impact.** A project may directly induce growth if it would remove barriers to population growth such as a change to a jurisdiction's General Plan and Zoning Ordinance that allowed new residential development to occur. The Project would not construct housing or commercial facilities, and would not modify the land use or zoning designations for the Project sites to permit new residential or commercial development. It would not remove an obstacle to growth. Therefore, there would be no impact.

The Project would generate up to 30 construction jobs, but this would be a temporary effect and would not provide permanent economic growth to the area. No new employees would be hired as a direct result of Project implementation. Therefore, the effect on employment and economic growth would be less than significant.

A project may indirectly induce growth if it increases the capacity of infrastructure in an area in which the public service currently meets demand. Examples include increasing the capacity of a sewage treatment plant, or a roadway beyond that needed to meet existing demand. The dewatering facility would enhance existing sludge treatment without a RWRF capacity increase; therefore, there would be no impacts.

b) **No Impact.** No housing is located on the Project sites and none would be displaced by the proposed Project. Therefore, no impacts on housing would occur.

c) **No Impact.** No housing is located on the Project sites and no individuals would be displaced by the proposed Project. Therefore, no impacts on displacement of individuals would occur.

2.3.14 Public Services

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☐	☒
iv) Parks?	☐	☐	☐	☒
v) Other public facilities?	☐	☐	☐	☒

Discussion:

a)-i) **Less Than Significant Impact.** The Fresno Fire Department is the agency responsible for providing fire protection services to the City of Fresno. There are 24 fire stations in the City of Fresno; the closest to the Project site is Station 7, located at 2571 South Cherry at Jensen (Fresno, City of, 2010). The proposed Project does not involve construction of housing and would not increase risk of fire because the facilities would be enclosed. The Project would

not otherwise increase the demand for fire protection services. Therefore, there would be no long term-impact on fire protection services and impacts are considered less than significant.

a)-ii) **Less Than Significant Impact.** Police service in Fresno is provided by the Fresno Police Department (Fresno, 2010). The dewatering facilities would be located in a within an existing fenced RWRF site in an enclosed, secured structure. No additional police service would be required for the Project. Therefore, there would be no long-term impact on police protection services, and impacts are considered less than significant.

a) -iii), -iv), and -v) **No Impact.** The proposed Project does not involve construction of housing, or any increase in permanent personnel that would result in a substantial increase in the demand for schools, parks, or other public services or facilities. No new or physically altered facilities for public services would be required. Therefore, no impacts on schools, parks or other public facilities would occur.

2.3.15 Recreation

	Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b)	Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion:

a) **No Impact**. The proposed Project does not involve construction of housing or other facilities that would result in an increase in the use of existing parks or other recreational facilities. There are no recreational facilities in the construction site area, which is within an existing RWRF facility. Therefore, there would be no impacts.

b) **No Impact.** The proposed Project does not include recreational facilities or involve the expansion of existing recreational facilities. Therefore, no impacts would occur.

2.3.16 Transportation and Traffic

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

Discussion:

a) and b) **Less than Significant Impact.** The Council of Fresno County Governments is the Metropolitan Planning Organization and Regional Transportation Planning Agency for Fresno County. Development of the region's transportation system is guided by the 2007 Regional Transportation Plan, which is currently being updated (COG).

Caltrans makes traffic counts for off ramps in the study area along Highway 99, Highway 180, and Highway 41, which are the closest state highways to the Project site. Direct access to the site would be from 99 to 180 west to south on Cornelia and west on Jensen. Alternatively, from Highway 41 on the south side of Fresno, take the Jensen Avenue exit, then west on Jensen for 6 miles to the main entrance.

Level of Service (LOS) is an indicator of the operating conditions of a roadway or an intersection, and is used to represent various degrees of congestion and delay. It is measured from LOS A (excellent conditions) to LOS F (extreme congestion). LOS D is the acceptable limit of service established by the City of Fresno (Fresno General Plan MEIR, 2002). The Fresno General Plan Draft Master EIR maps streets projected to be constrained by a capacity of greater than LOS D without mitigation within the City of Fresno Sphere of Influence. The

Project site located at the intersection of Cornelia Avenue and Jensen Avenue; this area is not mapped on the General Plan Draft Master EIR. However, the Project site is not located in a high-traffic, urbanized area, but rather is surrounded by agricultural land uses.

Construction of the proposed Project would require initial transport of construction equipment to the Project site. Truck trips would be required to import construction material and to transport excess spoil and demolition debris within the existing site. Construction workers commutes would occur daily throughout the construction period. Construction worker commutes could add traffic during the peak hours; the estimated number of required construction workers would range from 20 to 30 individuals during the period of highest activity.

As such, Project-related construction would add no more than 30 vehicles per day. Caltrans will require a permit for the movement of heavy equipment on State roadways. A short-term impact would result from vehicle trips to and from the site for hauling materials and for worker commutes. In addition, prior to construction, neighboring agricultural properties and emergency service providers would be notified with regard to construction schedule and planned haul routes.

Following construction, no additional personnel would be required to operate the facilities. Additionally, construction of the new facilities would result in a reduction of haul trips, from approximately 14.5 truckloads per day to 10.6 truckloads per day. Accordingly, since the proposed Project would not conflict with Fresno COG or Caltrans regional transportation planning, and since the Project is not growth inducing and would be constructed on an existing RWRF site, construction and operation impacts of the Project relative to the circulation system would be less than significant.

c) **No Impact.** The proposed Project site is not located within an airport land use plan, and is not located within 2 miles of a public/public-use airport or a private airstrip. Fresno Chandler Executive Airport is approximately 4 miles to the northeast. Therefore, the proposed Project would not affect air traffic levels or patterns.

d) **No Impact.** The proposed Project does not involve any changes to a design feature of a roadway. Therefore, no impacts would occur.

e) **Less Than Significant Impact.** During construction, the presence of the construction equipment and the presence of slow-moving construction equipment and vehicles on local roads could have a temporary impact on access for emergency vehicles. However, as stated above, prior to construction, neighboring properties and emergency service providers would be notified with regard to construction schedule and planned haul routes. Therefore, impacts would be less than significant.

f) **No Impact.** The proposed Project would not result in a substantial long-term increase in traffic or in a permanent change in existing transportation systems. Therefore, the proposed Project would not conflict with adopted policies, plans, or programs supporting alternative transportation. Therefore, no impacts would occur.

2.3.17 Utilities and Service Systems

Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statues and regulations related to solid waste?	☐	☐	☒	☐

Discussion:

a) **No Impact.** The proposed Project involves only sludge dewatering enhancements and yard piping on an existing site. Wastewater treatment requirements would not be affected. The wastewater treatment plant would operation benefit from a smaller sludge volume to be disposed of. Therefore, no impact would occur.

b) **Less than Significant Impact.** The proposed Project involves yard piping and sludge dewatering facilities on the site of an existing RWRF. No additional wastewater or water treatment is required. Therefore, the impact would be less than significant.

c) **Less than Significant Impact.** The site drainage is to existing onsite runoff collection system that conveys runoff to the RWRF headworks. No change would be required as a result of the dewatering facilities. Therefore, impacts on stormwater drainage facilities would be less than significant.

d) **No Impact.** The Project has sufficient water supplies available to serve the Project and involves no new or expanded entitlements. Therefore, no impacts on water supplies would occur.

e) **No Impact.** The proposed Project would not require any new connections to the existing sewer system and would not affect the RWRF capacity. Therefore there would be no affect on wastewater treatment services.

f) **Less than Significant Impact.** The dewatering facility upgrade is proposed to be constructed in a paved or previously graded area adjacent to the existing facilities. Construction of the new facilities and yard piping would involve minor additional earthwork to clear and grade the land, including some asphalt removal. No vegetation removal would be required. Approximately 1,560 cu yd of soil would be excavated and suitable soils would be reused to backfill the trench once the pipes were installed. Excess soils would be stockpiled on site.

Most of the asphalt materials that are demolished as part of the project will be transported to a recycled asphalt storage pile on the plant site for grinding and reuse for future paving needs. The only area from which asphalt will be disposed of off-site and not recycled is approximately 3,000 square feet located 80 feet due south of the proposed Dewatering Building Annex. This area has been used for the deposit and short-term storage of sewer manhole cleaning debris. Therefore, asphalt and a foot of underlying pavement base (sand and gravel) in this area would be disposed of offsite. The amount to be disposed of off-site would be minor, approximately 100 cubic yards.

The closest landfill is the American Avenue landfill, a Fresno County facility, located at 18950 West American Avenue, Kerman, CA, 93630, approximately 4 road miles southwest of the RWRF. However, in May 2004 the Fresno County Board of Supervisors approved an amendment to the County Ordinance Code banning the disposal of construction and demolition debris (which included asphalt) at the County-operated American Avenue and Coalinga Landfills. In 2007, the County published a guide that identified nine companies in the Fresno area that handle asphalt waste (Fresno County Department of Public Works and Planning, 2007). Therefore, the impact on local landfills would be less than significant.

The proposed Project would not result in substantial long-term increases in solid waste requiring offsite disposal. Sludge volume for disposal should decrease with Project implementation, a benefit, and the disposal route and location would not change. Therefore, the proposed Project would have less than significant impacts on solid waste disposal.

g) **Less than Significant Impact.** As discussed in **Section 2.3.16(f),** above, there is no aspect of the proposed Project that would result in a significant impact on solid waste or conflict with statutes related to solid waste. During construction, excess soil would be stockpiled on site. A small amount of existing paving may need to be hauled to an appropriate landfill. The City would continue to comply with all federal, state, and local statutes and regulations related to solid waste. Therefore, the impacts would be less than significant.

2.3.18 Mandatory Findings of Significance

	Issues and Supporting Information Sources	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b)	Does the project have the potential to achieve short-term, to the disadvantage of long-term, environmental goals?	☐	☐	☒	☐
c)	Does the project have impacts that are individually limited, but cumulatively considerable ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, effects of other current projects, and the effects of probable future projects.)?	☐	☐	☒	☐
d)	Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☒	☐

Discussion:

a) **Less than Significant with Mitigation Incorporated**. The proposed road repaving and widening element of the project has the potential to affect burrowing owl, if present. Implementation of Mitigation Measure BI-1 will reduce the impact to less than significant. Cultural resources analyses found no potential impacts on historic or archaeologic resources. Therefore, impacts would be less than significant with mitigation incorporated.

b) **Less than Significant**. The proposed Project involves the construction and operation of the Dewatering Facilities Upgrade and associated yard piping. The Project will allow the City to improve the long-term efficiency of its sludge dewatering at the existing RWRF. The benefits are long term and the impacts are short term and less than significant.

c) **Less than Significant.** The potential site-specific impacts of the proposed Project are primarily related to construction effects. If the timing of Project construction overlapped with the construction of the related projects on site, cumulatively considerable but temporary impacts could occur locally on dust generation and noise. However, with the implementation of required dust control measures and with notification of neighboring agricultural properties and emergency services providers, these impacts would be less than significant.

d) **Less than Significant Impact.** There would be no substantial direct or indirect adverse impacts on human beings. Therefore, the impact would be less than significant.

Section 3
References, Abbreviations and Report Preparation

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3.2 ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ARB	(California) Air Resources Board
BFP	belt filter press
BMPs	best management practices
BPS	Best Performance Standards
CalARP	California Accidental Release Prevention (Program)
CalEPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
City	City of Fresno
CNPS	California Native Plant Society
CO	Carbon monoxide
COG	Council of Fresno County Governments
cu ft/hr	cubic feet per hour

cu yd	cubic yard
CUPA	Certified Unified Program Agency
dBA	Decibel, A-weighted scale
DOGGR	(California) Division of Oil, Gas & Geothermal Resources
EDR	Environmental Data Resources, Inc.
EERI	Earthquake Engineering Research Institute
Farmland	Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
FCMA	Fresno County Metropolitan Area
FCTA	Fresno County Transportation Authority
FEMA	Federal Emergency Management Agency
GAMAQI	Guide for Assessing and Mitigating Air Quality Impacts
GHG	Greenhouse gas
gpd	gallons per day
gpm	gallons per minute
HCP	Habitat Conservation Plan
HP	horsepower
IES	Initial Environmental Study
kW	kilowatts
kWh	kilowatt-hours
lb/day	pound(s) per day
Leq	Equivalent noise level
LOS	Level of Service
MDBM	Mount Diablo Baseline and Meridian
mgd	million gallons per day
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCCP	Natural Communities Conservation Plan
NDDB	(California) Natural Diversity Database
NOx	Nitrogen oxide
NRC	Noise reduction coefficient
PG&E	Pacific Gas & Electric
PM2.5	particulate matter 2.5 microns or less in diameter

PM10	particulate matter 10 microns or less in diameter
psi	pounds per square inch
PUC	Public Utilities Commission
ROW	right of way
RTP	Regional Transportation Plan
RWRF	Regional Water Reclamation Facility
SB	Senate Bill
SF6	Sulfur Hexafluoride
SJVAB	San Joaquin Valley Air Basin
SJVIC	San Joaquin Valley Information Center
SJVUAPCD	San Joaquin Valley Unified Air Pollution Control District
SOI	Sphere of Influence
SOx	Sulfur oxides
SPAL	Small Project Analysis Level
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
UBC	Uniform Building Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VMT	Vehicle Miles Traveled
VOC	Volatile organic compound
µmhos/cm	micromhos per centimeter

3.3 PREPARERS OF THE INITIAL ENVIRONMENTAL STUDY

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Appendix A
Greenhouse Gas Emissions Analysis

Appendix A
Greenhouse Gas Emissions Analysis

Table 1- Construction Equipment by Phase

Equipment	Number	Total hours or miles
Phase 1 - Site Preparation and Earthwork (2 Mo. Total Duration)		
Backhoe	2	2 mo x 2 = 320 hr
Blade/grader	1	1 mo = 80 hr
Earthmover	1	1 mo = 80 hr
Dump Truck	1	1 mo = 80 hr
Frontend loader	1	1 mo = 80 hr
Roller	1	2 mo = 160 hr
Water truck	1	2 mo x 4 hr//day = 80 hrs
Pickup trucks	2	25 mi/day RT x 2 = 50 mi /day RT x40 days = 2000 mi
Workers' commutes	12	40 mi/day/worker x 12 = 480 mi/day x 40 days = 19200 mi
Phase 2 - Building Construction (6 Mo. Total Duration)		
Grade-all/forklift	2	4 mo = 320 hr
Crane	1	5 mo = 400 hr
Backhoe	1	4 mo = 320 hr
Air compressors	2	6 mo = 480 hr
Materials deliveries – concrete		180 trips x 40 mi/trip = 7200 mi
Materials deliveries – rebar		5 trips x 40 mi/trip = 200 mi
Materials deliveries – roofing decking		10 trips x 40 mi/trip = 400 mi
Pickup trucks	3	25 mi/day x 3 x 6 mo = 9000 mi
Workers' commutes	25	25 x 40 mi/day x 120 days = 120,000 mi
Phase 3 - Construction Completion (10 Mo. Total Duration)		
Grade-alls/forklifts	2	9 mo x 80 hr x 2 = 1440 hr
Air compressors	2	9 mo x 80 hr x 2 = 1440 hr
Water truck	1	4 hr/day x 20 days = 80 hr
Roller	1	1 mo x 80 hr = 80 hr
Paver	1	0.5 mo x 80 = 40 hr
Materials deliveries – centrifuges, pumps	40	200 mi/RT x 40 RT = 8000 mi
Materials deliveries – rock and asphalt	20	20 trips x 40 mi/trip = 800 mi
Workers' commutes	25	25 x 40 mi/RT/day x 120 days = 120,000 mi

Table 2- Greenhouse Gas Emission Estimates

Emissions Source (on-road vehicles)	Vehicle Type	No.	Est Max miles per day	Emission Factor (lbs/mi) 1			Estimated Emissions (lbs)		
				NOx	C02	CH4	NOx	C02	CH4
Delivery Truck	HHDT	60	8800	0.345581	4.220457	0.000129	182466.768	2228401.3	68.112
Commuting Vehicle	PV	25	120000	0.000845	1.102352	0.000077	2533.812085	3307056	231
Emissions Source (construction equipment)	**No.**		**Est Max hrs of use per day**	**Emissions Factor (lbs/hr) 2**			**Estimated Peak Day Emissions (lbs/day)**		
				NOx	C02	CH4	NOx	C02	CH4
Forklift	2		1440	0.4742	54.4	0.0057	1365.696	156672.0	16.416
Air Compressor	2		1440	0.6923	63.6	0.0095	1993.824	183168.0	27.360
Water Truck	1		80	2.1941	260.0	0.0212	175.528	20800.0	1.696
Paver	1		40	0.9421	77.9	0.0152	37.684	3116.0	0.608
Roller	1		80	0.7342	67.1	0.0100	58.736	5368.0	0.800
Total							**185,059.3**	**5,540,825.3**	**299.9**
CO Equivalent Total							**5,449,996.9**	**5,540,825.3**	**6,298.2**
Grand Total								**10,997,120.3**	**lb**

Notes: PV: passenger vehicle
Sources:
1 SCAQMD. 2007a. EMFAC2007 version 2.3 Emission Factors for On-Road Passenger Vehicles & Delivery Trucks. Scenario Year 2011.
2 SCAQMD 2007b. SCAB Fleet Average Emission Factors (Diesel). Scenario Year 2011.

Total CO2e										
Phase 1							347,850	**lb**		
Phase 2							11,168,230.0			
Phase 3							10,997,120			
Total							**22,513,200**	**lb**		
(2205 lb/MT)							**10,210 MT**			
Tons per year (18 mo construction)							6,807 MT first	12 mo; 3,403 MT subsequent 6 mo)		

Appendix B
Cultural Resources Analyses

Archaeological and Historical Resources

Paleontological Resources

Cultural Resources Inventory for the Dewatering Facility Upgrade Project, Fresno-Clovis Regional Water Reclamation Facility, Fresno County, California

Randy Baloian

Prepared By

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Submitted To
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October 2010

USGS Kearney Park 7.5-min. quad
9 acres
Key Words: No resources found

MANAGEMENT SUMMARY

Applied EarthWorks, Inc. performed a cultural resources inventory to support an upgrade to the dewatering facility at the Fresno-Clovis Regional Water Reclamation Facility. The investigation involved a records search and background review, Native American consultation, and a pedestrian survey of construction areas within the 9-acre study area. The study found no cultural resources nor any definitive evidence that such resources would be exposed during construction. Based on the findings and assessment, no further investigation is recommended.

If archaeological remains are discovered, all construction should halt and a qualified archaeological notified to assess the find. Additionally, if human remains are exposed, the Fresno County Coroner is to be notified to arrange their proper treatment and disposition; if the remains are determined to be Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the Native American Heritage Commission within 24 hours of discovery.

Field notes and photographs for this project are on file at Applied EarthWorks' office in Fresno, California. A copy of this report will be transmitted to the Southern San Joaquin Valley Information Center at California State University, Bakersfield for inclusion in the California Historical Resources Information System.

CONTENTS

1
INTRODUCTION

The City of Fresno plans to increase its capacity to process waste material by expanding its existing dewatering facility at the Fresno-Clovis Regional Water Reclamation Facility (RWRF). Located about 8 miles southwest of downtown Fresno, the RWRF consists of 2,080 acres of ponds, tanks, service and administrative buildings, and processing facilities (Figures 1-1, 1-2, and 1-3). The upgrade involves the construction of an annex adjacent to the Solids Dewatering Building to house additional dewatering units and a silo with connecting bridge, similar to the existing silo, for loading the processed "sludge cakes" onto trucks (Figure 1-4). The project also includes replacement of the pavement east of the facility. Construction will require site preparation, grading, and construction of the structures and yard piping (MWH Americas, Inc., 2010). It is assumed that the construction equipment would move onto the site when needed and remain on site until that phase of the work is completed.

Figure 1-1 **The existing dewatering facility consists of the solids dewatering building (right) and loading silo (left); the proposed expansion will involve the construction of an annex east (in front) of the building and a second silo to the north (right).**

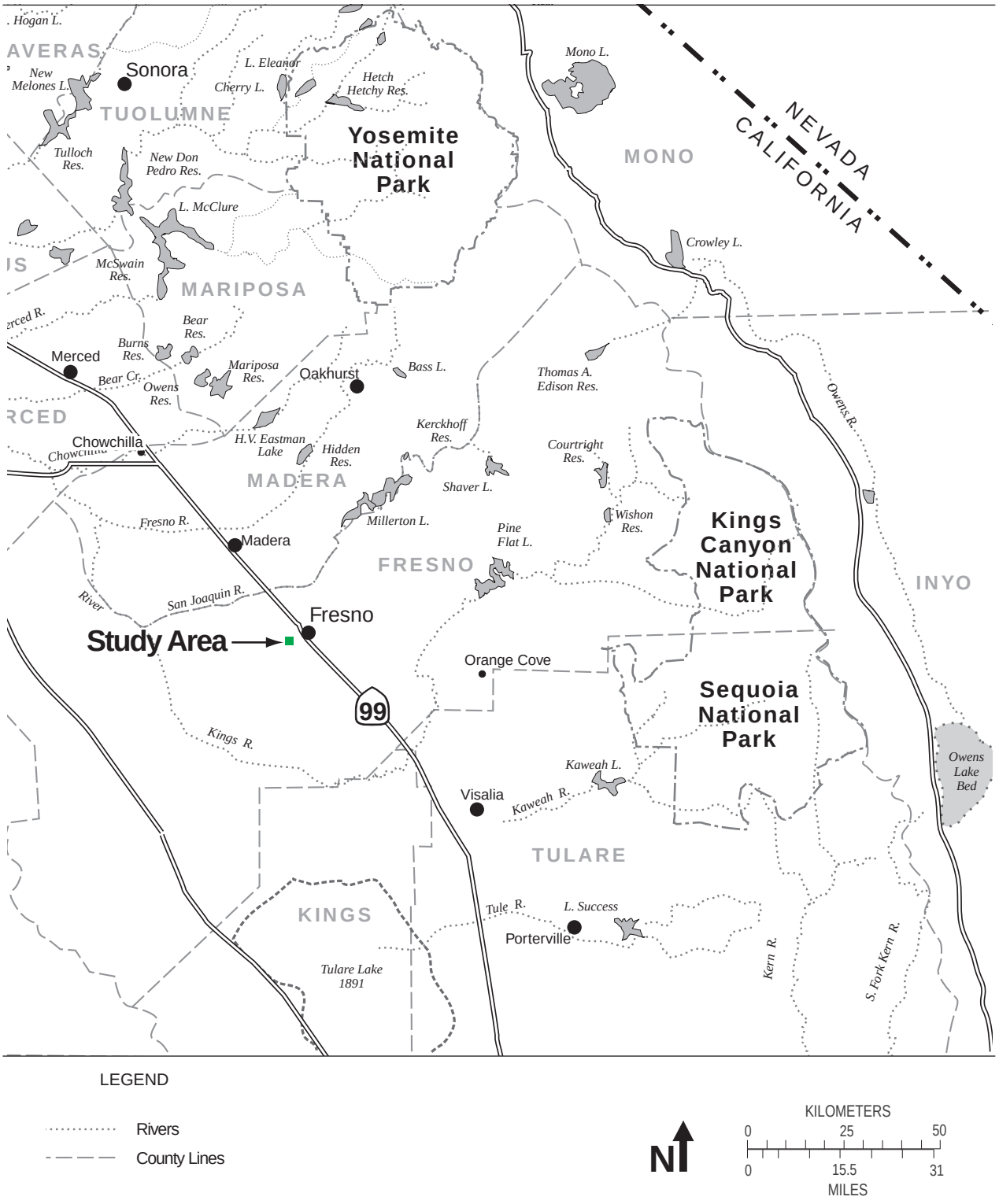
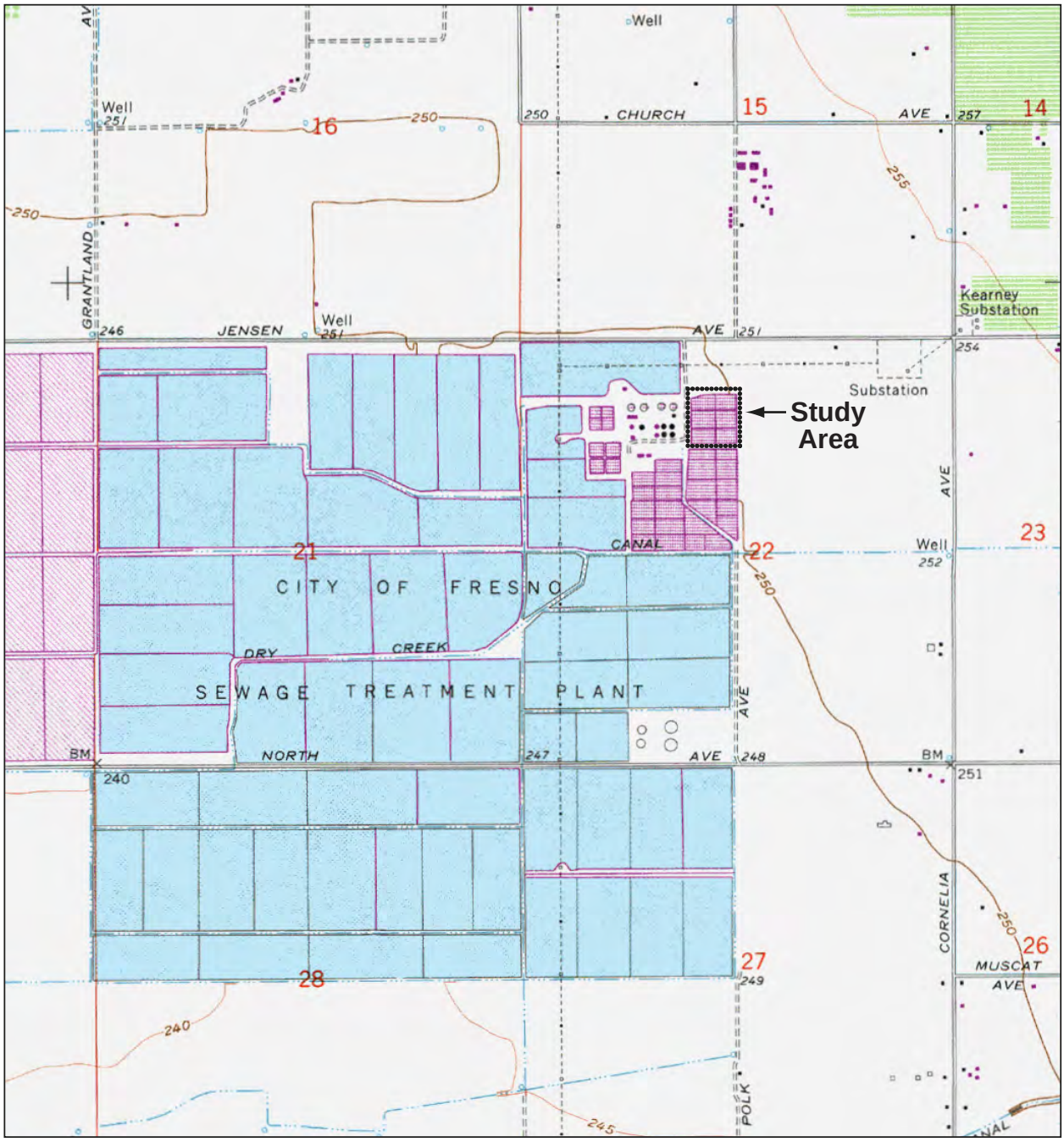


Figure 1-2 Project area in Fresno County, California.



Confidential: Not for Public Distribution

Prepared by Applied EarthWorks, Inc.

U.S.G.S. 7.5 Minute
Topographic Quadrangle
Kearney Park, CA
T 14 S - R 19 E
1963, Photorevised 1981

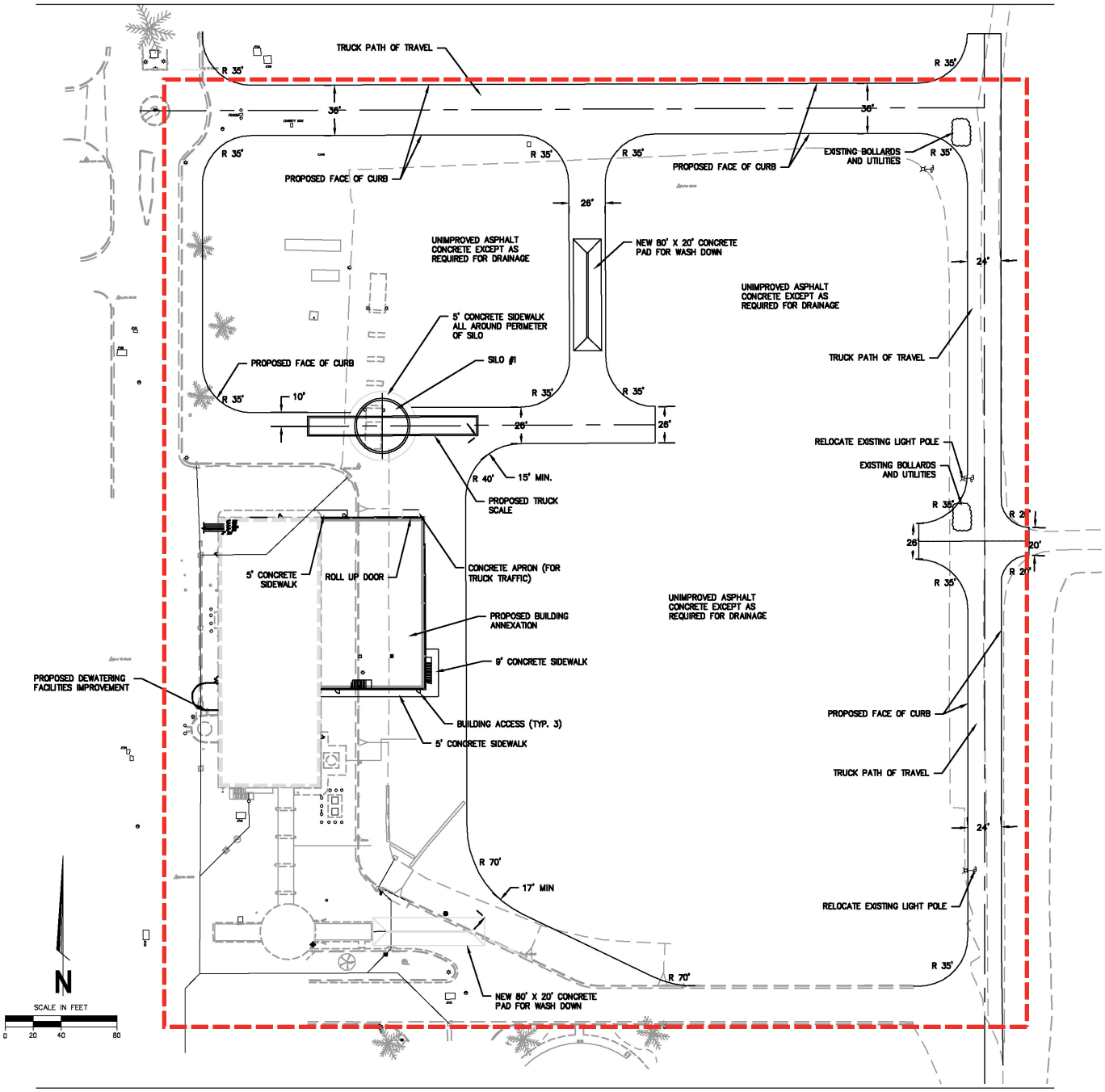
N

0 ½ 1

Miles

Contour Interval: 5 Feet

Figure 1-3 Location of the study area on the U.S. Geological Survey quadrangle.



Base Map: MWH, Map C-4, Site Plan for Proposed Dewatering Facilities

Final Map: L. Meckstroth — 11/OCT/10

LEGEND

Study Area

Figure 1-4 Upgrade project study area.

As owner and operator of the Fresno-Clovis RWRF, the City of Fresno is held accountable by the California Environmental Quality Act (CEQA), which mandates that government bodies consider the impact of their actions on the environment. If a project has the potential to cause substantial adverse change in the characteristics of an important cultural resource or "historical resource"—either through demolition, destruction, relocation, alteration, or other means—then the project is judged to have a significant effect on the environment (CEQA Guidelines, Section 15064.5[b]). Section 15064.5(a) of the CEQA Guidelines (as amended) defines a historical resource as one that: (1) is listed or determined eligible for listing in the California Register of Historical Resources (California Public Resources Code [PRC] Section 5024.1; Title 14, California Code of Regulations [CCR], Section 4852); (2) is included in a local register of historical resources (pursuant to Section 5020.1[k]) of the PRC), or identified as significant in a historical resources survey per the California Register eligibility criteria (PRC 5024.1[c]); or (3) is considered eligible by a lead agency under PRC 5020.1(j) or 5024.1. The definition subsumes a variety of resources, including prehistoric and historical archaeological sites, structures, buildings, and objects (CEQA Guidelines Section 15064.5[a] [3] and Section 15064.5[c]).

Normally, the first step in the CEQA process is the identification of resources and assessment of project effects through a cultural resources inventory. On behalf of the City of Fresno, MWH Americas, Inc. retained Applied Earthworks, Inc. (*Æ*) to for this purpose. *Æ*'s study area for the project covers about 9 acres and, based on the project description provided by MWH Americas, Inc. (2010), encompasses all areas subject to ground disturbance by the proposed expansion.

Æ staff archaeologist Randy Baloian performed the background research and Native American consultation, completed the pedestrian survey, and prepared this inventory report. Mary Clark Baloian (Ph.D.), a Registered Professional Archaeologist (RPA), served as project manager and technical reviewer. Personnel qualifications are provided in Appendix A.

2
SETTING

2.1 PHYSICAL ENVIRONMENT

The project area lies within the San Joaquin Valley. The San Joaquin Valley and its northern counterpart, the Sacramento Valley, comprise the Great Valley, a 50-mile-wide elongated trough that extends approximately 400 miles south from the Cascade Range to the Tehachapi Mountains (Norris and Webb 1990:412). This vast lowland parallels the Sierra Nevada, and this mountain range has had considerable effect on the valley's geological past and current hydrology.

From the late Mesozoic until the late Cenozoic, the area that would become the Great Valley served as a shallow marine embayment (Norris and Webb 1990:412). The Coast Ranges had yet to be formed, but the region received sediments from the eroding Sierra Nevada as well as marine deposition throughout this interval. These waters began to diminish around 10 million years ago and eventually were cut off from the ocean altogether by the formation of the Coast Ranges (starting in the late Pliocene), leaving tributaries and small lakes that survived until historical times (Hill 1984:28; Norris and Webb 1990:380). The several lakes that once dotted the western San Joaquin Valley—such as Lake Corcoran and Lake Tulare as well as Buena Vista and Kern lakes—have been reclaimed for agriculture (Norris and Webb 1990:431).

Much of the Great Valley rests upon thick strata of alluvial sediments laid down during the Quaternary (Norris and Webb 1990:Figure 12-9). It is this same soil that today makes the valley such a fertile agricultural region. Below these levels are layers from the Pliocene and older epochs, which consist of both marine (shale, sandstone) and nonmarine (basalt, andesite) materials. In the central and eastern parts of the valley, pre-Quaternary strata lie several thousand feet below the surface. At the southern margin of the San Joaquin Valley-Coastal Range boundary, however, faulting has pushed marine layers toward the surface, which has made western Kern, Kings, and Fresno counties historically rich areas for fossil fuels (Norris and Webb 1990:420, 428).

The Sacramento and San Joaquin rivers are the two dominant hydrologic features in the Great Valley. Each drains the surrounding mountain ranges before converging to carry water into San Francisco Bay. The project area is approximately 10 miles south of the San Joaquin River and adjacent to the Dry Creek Canal, which was at one time a natural seasonal watercourse. The annual rainfall for the region averages about 6–14 inches (Hill 1984:29), which falls primarily between November and April. Summers are generally hot and dry with temperatures often exceeding 100°F.

Modern agriculture in the San Joaquin Valley has produced vast areas of crops and other domesticated grass and plant species. Yet prior to the development of agriculture, wetlands surrounding the San Joaquin River and other waterways supported marshy or aquatic communities of tule (*Scirpus* sp.), cottonwood (*Populus fremontii*), sycamore (*Platanus racemosa*), and willow (*Salix* sp.) (Wallace 1978a:448–449). Farther from the rivers, grassy savanna plains with few trees covered the valley (Wallace 1978b:462). Sparse oak groves

occurred along some waterways and likely included interior live oaks (*Quercus wislizeni*) and valley oaks (*Q. lobata*), providing a portion of the vegetal food sources utilized by indigenous populations. Agricultural development and historic landscapes around the project vicinity include alfalfa and cotton fields and rural avenues lined by palm trees and other domesticated species planted during the late 1800s.

Modernization similarly has altered the variety of nondomesticated animal species found in the valley. Larger mammals such as black bear (*Ursus americanus*), black-tailed deer (*Odocoileus hemionus),* mule deer (*O. hemionus hemionus*), and mountain lion (*Felis concolor*) are now limited to the surrounding foothills and mountain ranges. Tule elk (*Cervus elaphus nannoides*) and pronghorn (*Antilocapra americana*), once prominent throughout the Great Valley, now exist in limited locations around the state (Jameson and Peeters 1988:220, 225). Historical accounts indicate that these two animals were a major food source for the Yokuts Indians, explorers, trappers, and others (Clough and Secrest 1984:27–28; Wallace 1978b:449).

2.2 CULTURAL ENVRONMENT

2.2.1 Prehistory and Archaeology

Over the past 40 years, a basic prehistoric sequence has emerged from numerous studies conducted in central California, many of which have taken place around ancient lakes in the southern part of the San Joaquin Valley (Moratto 1984:154; Rosenthal et al. 2007). Excavation of CA-KER-116, a prehistoric site at Buena Vista Lake, found a deeply buried component ascribed to the Western Pluvial Lakes Tradition and dating to the Pleistocene-Holocene transition (circa 11,500–7500 before present [B.P.]) (Fredrickson and Grossman 1977; Grossman 1968; Moratto 1984). Population density was low at that time, with a few settlements focused around the shores of ancient lakes and marshes or along stream channels. The tradition is characterized by a dependence on hunting mammals and birds and marked by a well-developed flaked stone industry including percussion-flaked foliate knives, Silver Lake and Lake Mojave points, lanceolate bifaces, crescents, large flake scrapers, drills, and gravers. During the Early Holocene (between 8000 and 4000 B.P.), the prehistoric economy centered on hunting and fishing, although mortars and pestles as well as ornamental *Olivella* and *Haliotis* shells appear occasionally in assemblages (Sutton 1997).

At the beginning of the Middle Holocene about 4000 B.P., the subsistence base expanded to include seed processing as a supplement to fish and fowl. Sites dating to this period contain assemblages comparable to the Early Horizon components of the Sacramento-San Joaquin Delta region, suggesting that older traditions sometimes survive into later periods (Moratto 1984; Riddell 1951; Walker 1947; Wedel 1941). It is difficult to clearly determine the ancestry of these early peoples, although artifact assemblages associated with occupations postdating 3000 B.P. may be linked to the ancestors of the ethnographic Yokuts. Material from the Late Holocene (1500 B.P. to the historic period) indicates a greater reliance on acorns and other plant foods as well as trade with the Central Coast region and Southern California interior (Moratto 1984:183, 188). Hartzell's (1992) investigations at CA-KER-39 and -116 revealed year-round villages at Buena Vista Lake.

2.2.2 Ethnography

Prior to Euro-American incursion into California's interior, the Yokuts people inhabited the San Joaquin Valley as well as portions of the southern Sierra Nevada foothills. Ethnographers have traditionally divided the approximately 40 known Yokuts tribes into north valley, south valley, and foothill categories based on linguistic characteristics (Silverstein 1978:446). While such broad groupings are helpful in reconstructing ethnohistory, they likely held little meaning for the individual Yokuts, who identified first with family and then with tribe. Although the Yokuts no doubt recognized cultural-linguistic similarities among their own tribes as well as differences between themselves and neighboring peoples like the Chumash, Miwok, and Mono, the primary and largest political unit was the tribe, which averaged about 300–350 people (Wallace 1978a:449, 1978b:466).

The project area does not clearly lie within the territory of a tribe or, for that matter, within the ethnographic region of one of the three Yokuts divisions. Based on Kroeber (1976: Plate 47, 484), the Fresno-Clovis RWRF appears closest to the territory of the Pitkachi—a Northern Valley Yokuts tribe that resided on the south banks of the San Joaquin River around present-day Herndon. Other tribes may have frequented the study vicinity. The foothill dwelling Gashwusha inhabited the upper reaches of Big and Little Dry Creek but were known to range into the Fresno area to gather seeds in the spring and summer (Kroeber 1976:481). Moreover, the project area is less than 20 miles from the territories of Apiachi, Aiticha (Kocheyali), and Wechihit, Southern Valley Yokuts tribes that established their settlements along the lower Kings River (Kroeber 1976 Plate 47).

All Yokuts tribes shared the same general hunter-gatherer subsistence strategy based on acorns, nuts, small and medium game, and fish. This basic strategy was by no means geographically uniform, and Yokuts diet varied from area to area depending on the availability and abundance of each food source. Wallace (1978a, 1978b) remarks that northern groups relied more heavily on acorns and salmon, while southern Yokuts exploited the resources in and around Tulare, Buena Vista, and Kern lakes. The annual range of the foothill tribes spanned the valley floor to the forests of the Sierra Nevada, providing a diversity of resources (Spier 1978:472). The material remains of subsistence activities survive today as bedrock milling stations where plants and seeds were processed; lithic scatters where stone tools were produced and used; and habitation sites, which contain these features and artifacts as well as dietary refuse (midden), hearths, house pits, and other indications of extended occupation.

Differences in resource availability and abundance within the territory of each tribe formed the basis for exchange among the Yokuts. For instance, Kroeber (1976:523) pointed out that the rarity of oaks in the areas occupied by Southern Valley Yokuts perhaps explains "the permanent association and commingling of the majority of these tribes with their foothill neighbors." Trade occurred at the broader interregional level as well. Local goods like steatite—a malleable stone used to make cooking bowls and ornaments—were traded to garner obsidian from the eastern Sierra Nevada and shell beads from the coast (Davis 1961).

2.2.3 History

The first Europeans known to have entered the San Joaquin Valley were Spanish soldiers led by Pedro Fages, who passed through the southern valley on his way to San Luis Obispo in 1772

(Wallace 1978a:459). In 1806, Lieutenant Gabriel Moraga led a group of Spanish explorers into the California interior to locate new lands for missions (Clough and Secrest 1984:25–27). Moraga is credited with naming both the Kings and San Joaquin rivers. Spain never extended the chain of coastal missions into the valley, and with Mexican Independence in 1821, it lost its Californian territory altogether. In contrast to its Spanish predecessors, the Mexican government encouraged immigration, afforded individuals the right to own property, and allowed foreign trade (Hackel 1999:129–132). Most importantly, the 1833 Secularization Act ended the mission's monopoly of prime California real estate. In the 13 years between secularization and the American possession, the Mexican governors of California made 800 land grants, many to native and foreign-born soldiers (Monroy 1999:180). In 1846 General José Castro received *el Rancho del Río San Joaquin*, a 48,801-acre grant that extended along both sides of the San Joaquin River from north of Friant to just below Herndon (Clough and Secrest 1984:34–36). After the end of the Mexican-American War and accession of California to the United States in 1848, Castro attempted to subdivide and sell his grant, but like many of the Mexican ranchos, confirmation of his title under U.S. law was both costly and unsuccessful.

The California gold rush, which brought droves of miners to the Sierra Nevada foothills in search of the precious ore, marked the beginning of the first significant Euro-American settlements in what would become Fresno County. Outposts such as Fort Miller and the Campbell's Ferry (later Centerville) offered river crossing points, supplies, lodging, and, in the case of the former, fortification from Indian attacks (Clough and Secrest 1984:44–68). Located on the south bank of the San Joaquin River, Fort Miller grew into the town of Millerton, which became Fresno County's first seat in 1856.

During the 1850s and 1860s, Fresno County slowly developed its agrarian economy based on farming and ranching. By the beginning of the 1870s, however, the pace of development began to accelerate, with agriculture leading the way. In 1872 the Southern Pacific Railroad rolled into Fresno County, connecting the previously remote region with northern California. Shortly afterward, the town of Fresno was born and quickly rose to replace Millerton as the county seat in 1874. In that same year, California enacted the "no fence" law, a decidedly pro-agriculture statute that held ranchers responsible for damages caused by their herds and compelled them to sequester their holdings. Moses Church and A. Y. Easterby and their Fresno Canal and Irrigation Company constructed one of the first extensive irrigation system in the valley, which began supplying water to their agricultural development in 1876 (Clough and Secrest 1984:143). In the coming decades, a network of canals and ditches sprouted from the banks of the Kings River to provide water to various other farm colonies (Mead 1901).

For Church and other wealthy landowners, the intended effect of irrigation was to increase the value of their properties so that they could be subdivided and sold to newly arriving homesteaders at a hefty profit. While this primary purpose was certainly achieved, the advent of intensive irrigation additionally led to a shift in both the types of crops grown and the size of the typical farm. During the first decades of colonization, valley pioneers initially grew wheat and other grain crops or raised cattle—both large-scale ventures requiring substantial acreage. As irrigation water became more readily available, individual farmers realized that premium crops like grapes, citrus, and tree fruit could be profitably grown on lots as small as 20 acres.

Fresno was incorporated in 1885 with 3,000 residents. The growing population fueled continuing construction, which in turn, obliged the city to improve its infrastructure. In 1887, voters approved a $175,000 bond for a sewer system (Clough and Secrest 1984:320), with service beginning four years later (City of Fresno 2010). A 24-inch pipe conveyed the city's waste to a facility southwest of town, where the sewage was used to irrigate alfalfa fields—a practice that continued into the twentieth century. The main conduit was flushed daily by the Fresno Canal and Irrigation Company.

After suffering through an economic depression in the 1890s, Fresno rallied with an increase in crop varieties and the expansion of dairies and establishment of creameries. However, grapes for both wine and raisins continued to be the most important source of income. A prominent Fresno vineyardist named Martin Theodore Kearney helped form the California Raisin Growers Association. He lived on a 5,000-acre estate within the Fruit Vale Tract, which now serves as Kearney County Park, approximately 1.5 miles north of the Fresno-Clovis RWRF. Kearney Park Mansion was listed on the National Register of Historic Places in 1975 (NRIS 75000426).

By 1910, Fresno population had reached 25,000. Three years earlier, eight septic tanks had been added to the sewer farm to provide partial treatment of waste, but further expansion was need to meet the demands of the growing community (City of Fresno 2010). In 1909, the city acquired an 812-acre parcel. Located west of the original facilities, this property would eventually become the site of the current Fresno-Clovis RWRF. A series of improvements and expansions ensued, including the addition of 500 acres in 1917 and the construction of primary treatment plants in 1947 and 1958. The Fresno Sanitary Landfill—a separate but related development in sanitation by the City of Fresno—opened in the mid 1930s near the southwest corner of West and Jensen avenues. The site is a National Historic Landmark (NHLS 01001050) listed on the National Register of Historic Places as the first true landfill in the United States (National Park Service 2001).

In 1966 the City of Fresno was designated as the sewer agency for the entire Fresno Metropolitan area. The Fresno-Clovis RWRF latest major expansion occurred in the late 1990s when the plant installed a new headworks, biosolids dewatering equipment, and additional process units.

3
METHODS

3.1 RECORDS SEARCH AND RESEARCH

On 12 March 2010, Æ archaeologist Douglas McIntosh performed a records search at the Southern San Joaquin Valley Information Center at California State University, Bakersfield. McIntosh reviewed the Information Center's files and maps to identify previously recorded cultural resources and prior investigations that have occurred within a 1-mile radius of the study area. Other sources included the Historic Property Data File, the National Register of Historic Places, the California Register of Historical Resources, the listings of California Historical Landmarks, the California Inventory of Historic Resources, and the California Points of Historical Interest.

Æ also conducted archival research commensurate to the level of effort for a cultural resources inventory. Sources included the California Room at the Main Branch of the Fresno County Library, Æ's own library, and relevant Internet sites.

For the current investigation, information from previous archaeological studies and historical materials is particularly useful in assessing the likelihood that buried cultural deposits exist within the project area; much of the project area is paved over, thus limiting the amount of data that can be obtained from an archaeological survey (see Section 4.3).

3.2 NATIVE AMERICAN CONSULTATION

Pursuant to the State Public Resources Code Section 5097.9, state and local agencies cooperate with and assist the Native American Heritage Commission (NAHC) in its efforts to preserve and protect locations of sacred or special cultural and spiritual significance to Native Americans. On 1 April 2010, Æ contacted the NAHC to request a search of its sacred lands file to identify Native American resources in the study vicinity and to obtain the names and contact information for individuals knowledgeable of such resources. Next, Æ mailed letters summarizing the current project and investigation to individuals identified by the NAHC, soliciting information about the study vicinity in general and the whereabouts of Native American sites in particular (see Appendix B). Approximately 3–4 weeks after the letters were sent, Æ followed up to confirm that the correspondence had been received and to provide an opportunity for comment.

3.3 SURVEY

Æ historian Randy Baloian performed an archaeological field survey of the study area on 6 April 2010. The survey entailed walking systematic transects spaced at 15–20-meter intervals over the portion of the study area with exposed ground. The remainder of the area, which contained existing structures or asphalt surface, was cursorily examined. Raul Gonzalez of the RWRF accompanied the surveyor and provided useful information about the project. Baloian photographed the survey area using a digital camera to document the cultural and natural setting and ground visibility at the time of survey. Digital files are archived at Æ's office in Fresno.

4
FINDINGS

4.1 RECORDS SEARCH AND BACKGROUND RESEARCH

The records search revealed that although the study area has not been previously subject to systematic examination, several archaeological investigations for the Fresno Clovis RWRF have been performed near or adjacent to the project area.

Scott (1992) and Dick-Bissonnette (1994) surveyed the alfalfa fields immediately southeast and east of the current study area but found no cultural resources. Two years later, *Æ* covered several hundred acres, including locations adjacent to the northern and western boundaries of the current study area (Flint 1996). In addition to the pedestrian survey, *Æ* reviewed the plant's daily field records from 1994, which indicated that ground and flaked stone artifacts had been encountered during earthmoving activities throughout the plant (Flint 1996:4). Although these prehistoric remains were never formally recorded, *Æ* did relocate and document a historical site (CA-FRE-3064H [P-10-003081]) that had been previously noted in the Fresno-Clovis RWRF files. Located approximately 250 feet north of the current study area, CA-FRE-3064H contained bottle and other glass, ceramic, brick, and concrete fragments dating to the 1930s/1940s. Due to its apparent lack of significance associations, probable secondary deposition, and poor condition, the site was not considered important under CEQA (i.e., not eligible for listing on the California Register); the historical debris has since been hauled away.

Based on a potential for exposing significant finds in 1996, *Æ* recommended archaeological monitoring during construction (Flint 1996:6). In making this advisement, *Æ* considered the discovery of isolated artifacts noted in the plant's records as well as past investigations in the valley that have identified other buried prehistoric deposits where no surface materials were visible (cf. Fredrickson and Grossman 1977; Jennings 1971; Moratto 1988; Varner 1976). Given the amount of flooding experienced by the valley over geological time, buried sites—particularly those near water courses—are often covered by several feet of alluvium and are only exposed through erosion or ground-moving activities. Subsequent monitoring occurred at construction locations about 500–1,500 feet southwest of the current study area (Flint 1997). Two isolated artifacts were identified: a single basalt flake and a fragment from a Pepsi bottle manufactured sometime between 1937 and 1950. Examination of stratigraphy suggested that the monitoring area lay within the remnant streambed of Dry Creek, which possibly accounted for the "less than anticipated" quantity of prehistoric material recovered during the investigation (Flint 1997:13).

In 1999, *Æ* also monitored the RWRF's relocation of the Dry Creek Canal but encountered no archaeological material (Flint 1999). Similar to the 1997 monitoring effort, construction excavations occurred in the old Dry Creek channel, where intact cultural deposits would be unlikely to exist. Most recently, Brady (2005) surveyed several hundred acres in and around the Fresno-Clovis RWRF, including 80–100 acres west of the current study area; the investigation encountered no cultural resources.

Archival research indicated that other than the construction of the sewer plant, little development has occurred in the study area. An 1891 atlas of Fresno County shows no structures within the northwest quarter of Section 22 in Township 14 South, Range 19 East (Thompson 1891:64). During the late nineteenth and early twentieth centuries, the property was owned by the Hastings family (Harvey 1907; Thompson 1891). The indices of county histories (e.g., Coffey 1987) contain no listings for Hastings that might provide information about the property. Given the study vicinity, however, the land was likely used for agricultural purposes before it became part of the sewer plant. A 1935 atlas shows that the northwest quarter of Section 22 and all of Section 21 comprised the "Fresno City Sewer Farm" (Progressive 1935).

4.2 NATIVE AMERICAN CONSULTATION

In its 13 April 2010 response to *Æ*'s request for a search of its sacred lands file, the NAHC stated that the search did not indicate the presence of Native American cultural resources within a 0.5-mile radius of the proposed project site (see Appendix B for the full text of the NAHC letter). The commission noted, however, that Native American cultural resources lie "in close proximity" to the project area, without giving further details about content or location. With regard to role of Native American groups in the regulatory process, the NAHC remarked:

> Although tribal consultation under the California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000-21177) is 'advisory' rather than mandated, the NAHC does request 'lead agencies' to work with tribes and interested Native American individuals as 'consulting parties'. . . in order that cultural resources will be protected.

The commission's response included a list and contact information for 11 individuals with knowledge about Native American resources in Fresno County (Table 4-1). On 13 April *Æ* mailed a letter to each representative relating the findings of the records search and survey and soliciting information about the study area. On 23 and 26 April 2010, *Æ* followed up by e-mail or telephone to confirm receipt of the initial contact letter and provide opportunity for comment.

Table 4-1
Summary of Native American Consultation

Name/Affiliation	Results
Liz Hutchins Kipp, Big Sandy Rancheria of Mono Indians	Sent follow-up e-mail; no response to date.
Keith F. Turner, Dumna Wo-Wah Tribal Government	Left telephone message; no response to date.
Lawrence Bill, Sierra Nevada Native American Coalition	A representative of the coalition indicated that the study area was not particularly sensitive for Native American resources (26 April 2010).
Bob Pennell, Table Mountain Rancheria	Pennell stated that the study area is outside the rancheria's territory (26 April 2010).
John Davis, King River Choinumni Farm Tribe	Disconnected telephone.
Mandy Marine, Dunlap Band of Mono Indians	Sent follow-up e-mail; no response to date.
Jim Redmoon, Dumna Tribal Government	Left telephone message; no response to date.
Jerry Brown, Chowchilla Tribe of Yokuts	No message machine.
Carol Bill, Cold Springs Rancheria of Mono Indians	Left telephone message; no response to date.
Rosemary Smith, Choinumni Tribe of Yokuts	Sent follow-up e-mail; no response to date
David Alvarez, Traditional Choinumni Tribe	Alvarez indicated that project area is not within the Traditional Choinumni Tribe land base (30 April 2010).

4.3 SURVEY

The study area encompasses about 9 acres, most of which has been paved over with asphalt. Only about 20 percent (roughly 2 acres) of the surface is exposed; little vegetation grows on the area, which allowed excellent ground visibility during the survey (Figures 4-1 and 4-2).

Figure 4-1 View of the northern end of the study area looking east; the existing surface road is elevated about 1–2 feet above the asphalted surface (right) and likely lies on imported fill.

No cultural resources were encountered during the survey. The overlying soil appeared to be fill displaced from previous construction or imported for the existing dirt roads, which are elevated 1–2 feet above the asphalt area (Figure 4-2). Geologist Roland Brady (2010), who performed a paleontological survey for the project, examined a nearby construction excavation and observed that the study vicinity rests on a 2.0–2.7 foot layer of fill made up of clay and sandy silt. Below this upper level lies an approximately 2-foot layer of alluvial fan channel sand, followed by a stratum of silty sand of undetermined depth.

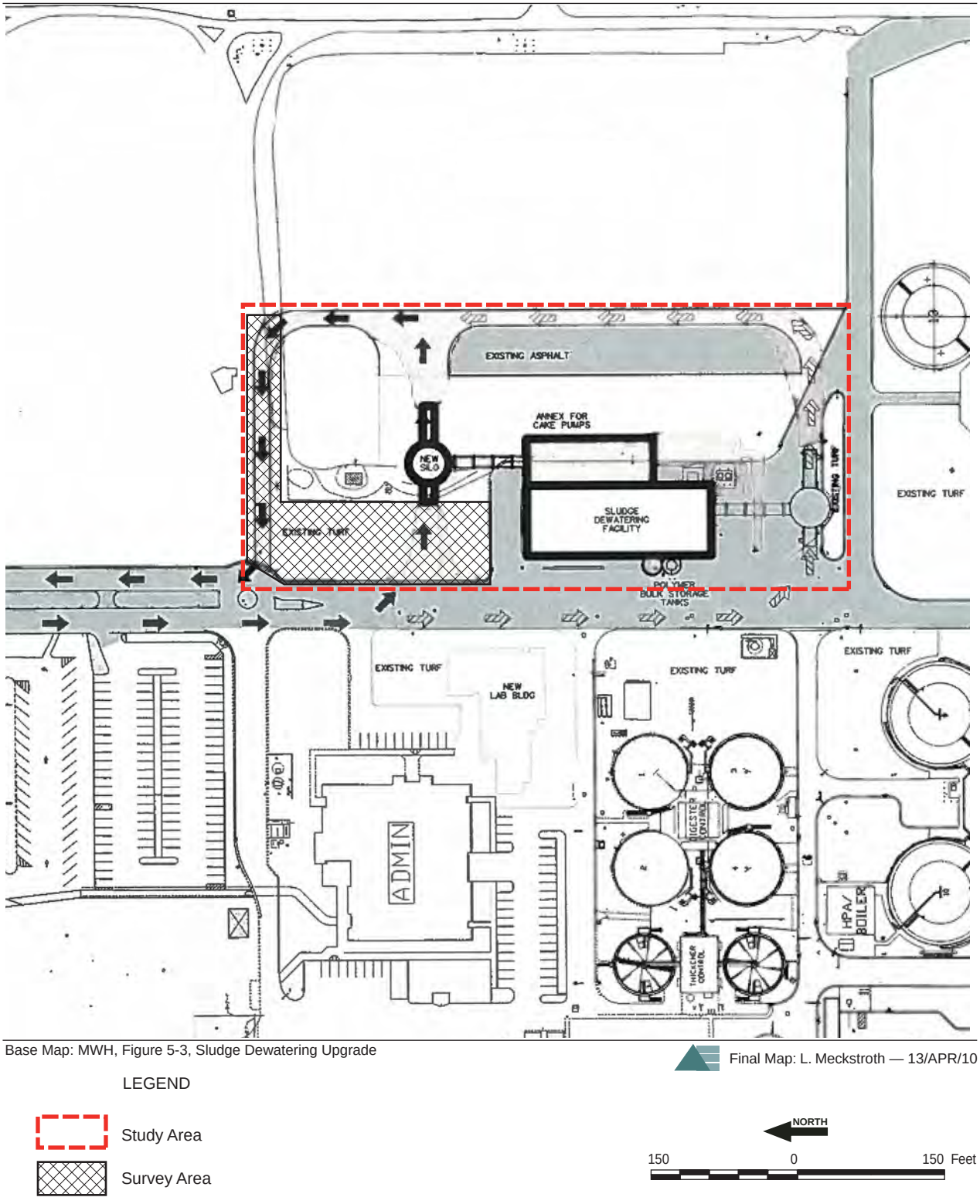


Figure 4-2 Portion of the study area examined by pedestrian survey.

5
RECOMMENDATIONS

In the mid 1990s, a cultural resources inventory of the Fresno-Clovis RWRF indicated that the plant lies within an archaeologically sensitive area (Flint 1996). That assessment was primarily based on the proximity of Dry Creek and correlation between archaeological remains and propinquity to water. At the time, *Æ* advised that an archaeological monitor oversee ground disturbing activities.

Æ's prior study notwithstanding, there are several reasons why monitoring is not warranted for the current expansion project. First, the current investigation found no cultural resources or any definitive evidence that such resources would be exposed during construction. Perhaps most significantly, the subsequent monitoring studies that followed Flint's cultural inventory encountered only isolated (nonsignificant) finds; *Æ* concluded that the construction excavations occurred in an old Dry Creek channel, which possibly accounted for the lack of prehistoric or historical cultural deposits (Flint 1997, 1999). Additionally, as its name suggests, Dry Creek was not a perennial watercourse during historical times. Prior to its conversion to an irrigation canal, the creek flowed as far southwest as the study area only during periods of flood. Thus, it did not represent a permanent source of water for Euro-American settlers or for Native American during the later prehistoric period. Lastly, it is unlikely that archaeological remains would be encountered given the parameters of the current project. According to Raul Gonzalez (personal communication 2010) of the Fresno-Clovis RWRF, while expansion of the dewatering facility will involved the excavation of utility trenches to a maximum depth of 10 feet below the surface, much of the ground disturbance will entail grading the upper 2 feet of soil, which, based on current archaeological and paleontological observations, is made up of imported fill where intact cultural deposits would not occur.

Nevertheless, the possibility of encountering archaeological material, although remote, still exists. *Æ* thus offers the following general recommendations:

- In the event that archaeological remains are encountered at any time during development or ground-moving activities within the entire project area, all work in the vicinity of the find should be halted until a qualified archaeologist can assess the discovery.
- If human remains are uncovered, or in any other case when human remains are discovered during construction, the Fresno County Coroner is to be notified to arrange their proper treatment and disposition. If the remains are identified—on the basis of archaeological context, age, cultural associations, or biological traits—as those of a Native American, California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendent who will determine the manner in which the remains are treated.

Unless the project changes to encompass other areas not surveyed by this investigation, no further studies are recommended.

6
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APPENDIX A

Personnel Qualifications

RANDY BALOIAN

Expertise

Historical research, architectural and archaeological survey and site evaluation, field logistics, statistical analysis, biological anthropology, proposal preparation, and budget analysis and accounting.

Education

M.A. Anthropology, University of California, Davis, 1989.
B.A. Anthropology, California State University, Fresno, 1986.
B.S. Business Administration, California State University, Fresno, 1986.

Professional Experience

2001– Historian/Administrative Archaeologist, Applied EarthWorks, Inc., Fresno, California.

1991–2001 Dock Foreman/Administrator, Mountain Produce, Inc., Fresno, California.

1986–1991 Teaching Assistant, University of California, Davis.

1981–1984 Office Staff, Fresno Mountain Foods, Inc., Fresno, California.

Technical Qualifications

Mr. Baloian conducts historical research, and evaluates architectural and archaeological resources, performs statistical analyses, prepares reports, and assists with various administrative tasks including budget and proposal preparation, logistical coordination, and project tracking. He has evaluated numerous historical resources in the Central Valley and Sierra Nevada foothills, including residences, ranch complexes, commercial structures, mining sites, recreational camps and parks, and irrigation canals. His research of the history of San Luis Obispo has supported architectural evaluations and archaeological investigations in that city. He also maintains the library and site record archives at Æ's Fresno office In addition to his duties as historian and archivist, Mr. Baloian routinely performs archaeological surveys and has participated in site testing and data recovery fieldwork. Mr. Baloian's academic studies focused on paleoanthropology, primatology, human genetics, statistical analysis, and the genetic and cultural manifestations of ethnicity. These theoretical interests complement his many years of experience in the produce industry, where his responsibilities ranged from customer relations and quality control to accounting and supervision of shipping and receiving.

MARY CLARK BALOIAN, RPA

Expertise

Prehistory of California, archaeological method and theory, lithic analysis, spatial analysis, cultural resources management, report production, and project field management.

Education

Ph.D. Anthropology, Southern Methodist University, 2003.
M.A. Anthropology, Southern Methodist University, 1995.
B.A. Anthropology, University of California, Davis, 1989.

Professional Experience

2000–	Staff Archaeologist, Applied EarthWorks, Inc. Fresno, California.
1998–2001	Adjunct Faculty Member, Fresno City College, Fresno, California.
1995–1996	Staff Archaeologist, Applied EarthWorks, Inc., Fresno, California.
1994–1995	Staff Archaeologist, INFOTEC Research, Inc., Fresno, California.
1992–1994	Teaching Assistant, Southern Methodist University, Dallas, Texas.
1989–1991	Archaeological Project Leader, California Department of Transportation, Sacramento.
1987–1989	Crew Chief/Instructor, Laboratory Assistant, and Curatorial Assistant, University of California, Davis.

Technical Qualifications

Dr. Mary Clark Baloian has been involved in archaeology in California and the western United States since 1987. Her areas of expertise include the prehistory of the San Joaquin Valley, Sierra Nevada, Great Basin, central California coast, and the Iron Age of West Africa. Dr. Baloian has served as Project Manager, Field Supervisor, Crew Chief, or Field Technician for projects throughout California, Oregon, Nevada, New Mexico, Texas, Hawaii, and West Africa. Her experience in cultural resources management includes research design, data acquisition, laboratory analysis, and preparation of technical reports and compliance documents; she also has completed the Advisory Council on Historic Preservation course in Section 106 compliance policies and procedures. Her analytic skills include lithic and ceramic analyses as well as settlement pattern studies and spatial analysis, which were the foci of her doctoral research. As a Staff Archaeologist for Applied EarthWorks, Dr. Baloian has directed surveys, testing and data recovery excavations, construction monitoring, and other studies at sites in Fresno, Madera, Mariposa, Kings, Tulare, San Luis Obispo, and Santa Barbara counties. Prior to joining Applied EarthWorks, she served as a Staff Archaeologist for INFOTEC Research, Inc. and Archaeological Project Leader for the California Department of Transportation (Caltrans), where she supervised archaeological surveys and assisted with test excavations and data recovery investigations in interior and coastal California. Dr. Baloian received National Science Foundation Dissertation Improvement Grant SBR-9813725 in 1998. She is a member of the Society for California Archaeology, Society for American Archaeology, and Society of Africanist Archaeology.

APPENDIX B

Native American Consultation

FAX TRANSMISSION

FAX (559) 229-2019 Phone (559) 229-1856

TO: Native American Heritage Commission

FAX NO.: (916) 657-5390

FROM: Randy Baloian

DATE: April 1, 2010

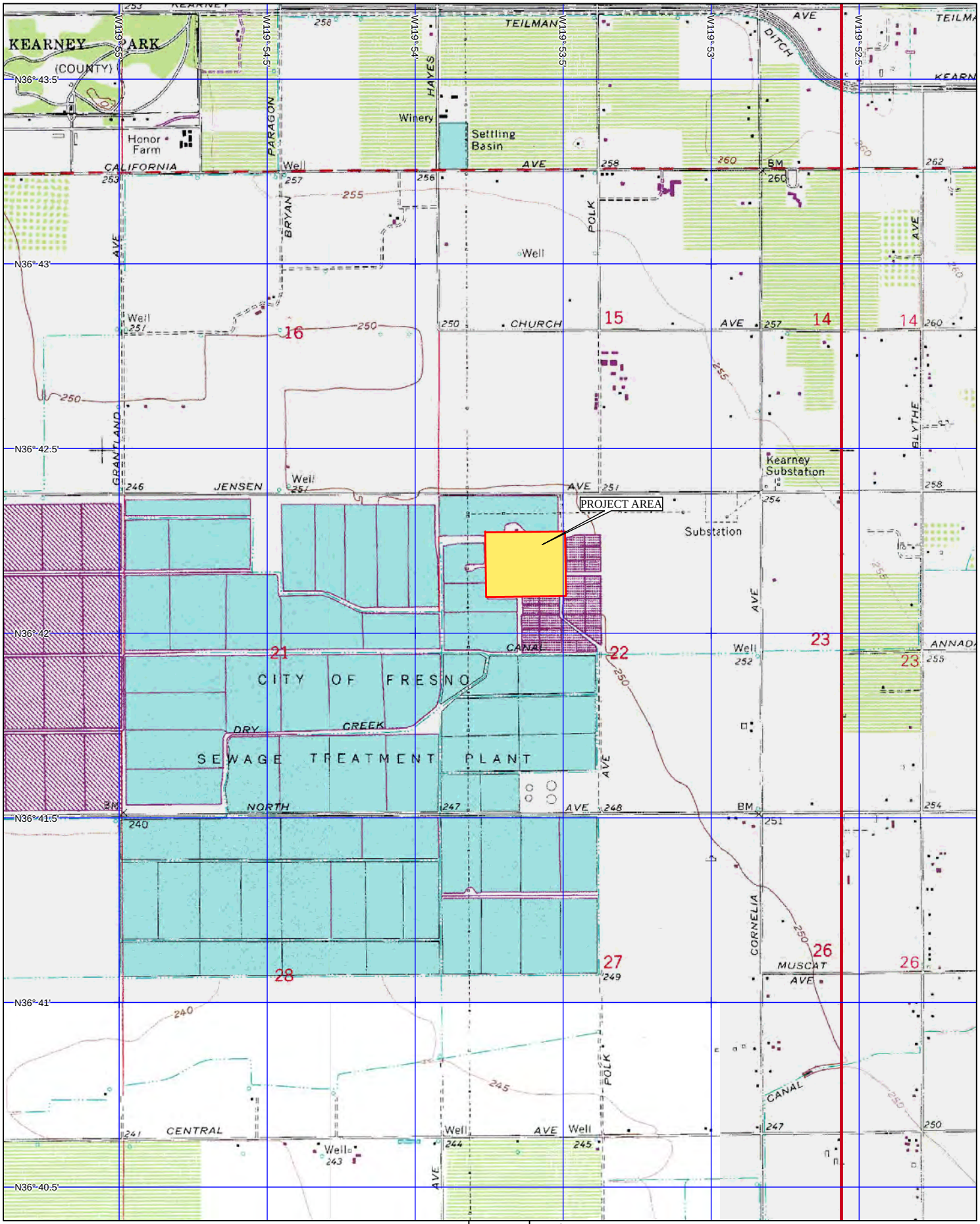
RE.: Request for Search of Sacred Lands Inventory File and Contact List

Number of pages, including this cover sheet: 2

Applied EarthWorks, Inc. is conducting a cultural resources inventory for the City of Fresno's Wastewater Treatment Plant. The City plans to construct a new dewatering facility within the plant grounds. The project area lies in Section 22 of T14S, R19E as shown on the Kearney Park USGS quadrangle (see map).

County	USGS Quad	Range	Township	Section
Fresno	Kearney Park	19E	14S	22

Æ formally requests that you review the Sacred Lands Inventory Files for sacred or sensitive areas that may be within or near the survey area. Additionally, we request the names and contact information of the Native American representatives in the project vicinity in order to provide these individuals with information regarding the project. Thank you for your assistance. Please do not hesitate to contact me if you have questions or require further information (559-229-1856, extension 23). Please FAX the results to us at (559) 229-2019 or e-mail to me at rbaloian@appliedearthworks.com



STATE OF CALIFORNIA Arnold Schwarzenegger, *Governor*

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
de_nahc@pacbell.net

April 13, 2010

Mr. Randy Baloian, RPA
Applied EarthWorks, Inc.
1391 West Shaw Avenue
Fresno, CA 93711

Sent by FAX to (559) 229-2019
No. Pages: 4

Re: Request for a Sacred Lands File Search and Native American Contacts List for the proposed "City of Fresno Wastewater Treatment Plant Project"; located in the City of Fresno; Fresno County, California

Dear Mr. Baloian:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources (c.f. CA Public Resources Code §21070; also c.f. *Environmental Protection Information Center v. Johnson [198]) 170 Cal App. 3rd 604*), was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE) requested. The California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177)) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the 2007 CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." The NAHC SLF search **did not indicate** the presence of Native American cultural resources within one-half - mile radius of the proposed project site (APE). However, there are Native American cultural resources in close proximity to the APE.

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation Coordinator's office (at (916) 653-7278, for referral to the nearest Information Center of which there are 10.

Consultation with tribes and interested Native American consulting parties, on the NAHC list ,should be conducted in compliance with the requirements of federal NEPA (42 U.S.C. 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 [f]*et seq),* 36 CFR Part 800.3 (f) (2), the President's Council on Environmental Quality (CSQ; 42 U.S.C. 4371 *et seq.*) and NAGPRA (25 U.S.C. 3001-3013), as appropriate. . The 1992 *Secretary of the Interior's Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including *cultural landscapes.*

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery. Discussion of these should be included in your environmental documents, as appropriate.

Although tribal consultation under the California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177) is 'advisory' rather than mandated, the NAHC does request 'lead agencies' to work with tribes and interested Native American individuals as 'consulting parties,' on the list provided by the NAHC in order that cultural resources will be protected. However, the 2006 SB 1059 the state enabling legislation to the Federal Energy Policy Act of 2005, does mandate tribal consultation for the 'electric transmission corridors. This is codified in the California Public Resources Code, Chapter 4.3, and §25330 to Division 15, requires consultation with California Native American tribes, and identifies both federally recognized and non-federally recognized on a list maintained by the NAHC

The response to this search for Native American cultural resources is conducted in the NAHC Sacred Lands Inventory, established by the California Legislature (CA Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10) although Native Americans on the attached contact list may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the under Section 304 of the NHPA or at the Secretary of the Interior' discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C, 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibly threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Attachment: Native American Contacts

Native American Contacts
April 13, 2010
Fresno County

Big Sandy Rancheria of Mono Indians
Liz Hutchins Kipp, Chairperson
P.O. Box 337 / 37302 Western Mono
Auberry , CA 93602
ck@bigsandyrancheria.com
(559) 855-4003
(559) 855-4129 Fax

Kings River Choinumni Farm Tribe
John Davis, Chairman
1064 Oxford Avenue Foothill Yokuts
Clovis , CA 93612-2211 Choinumni
559-324-9908

Dumna Wo-Wah Tribal Goverment
Keith F. Turner, Tribal Contact
P.O. Box 306 Dumna/Foothill
Auberry , CA 93602 Mono
(559) 855-3128 Home
(559) 696-0191 (Cell)

Dunlap Band of Mono Indians
Mandy Marine, Board Chairperson
Box 44 Mono
Dunlap , CA 93624
mandy_marine@hotmail.com
559-338-2545
559-274-1705

Sierra Nevada Native American Coalition
Lawrence Bill, Interim Chairperson
P.O. 125 Mono
Dunlap , CA 93621 Foothill Yokuts
(559) 338-2354

Dumna Tribal Government
Jim Redmoon - Cultural Resources Representative
724 W. Fountain Dumna/Foothill
Fresno , CA 93705 Choinumni
559-243--9926

Table Mountain Rancheria
Bob Pennell, Cultural Resources Director
P.O. Box 410 Yokuts
Friant , CA 93626-0177
(559) 325-0351
(559) 217-9718 - cell
(559) 325-0394 FAX

Chowchilla Tribe of Yokuts
Jerry Brown
10553 N. Rice Road North Valley Yokuts
Fresno , CA 93720
559-434-3160

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and federal NAGPRA.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Waste Treatment Plant Project; located in the City of Fresno; Fresno County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Native American Contacts
April 13, 2010
Fresno County

Cold Springs Rancheria of Mono Indians
Carol Bill - Tribal Administrator
PO Box 209 Mono
Tollhouse , CA 93667
coldsprgstribe@netpt
(559) 855-5043

(559) 855-4445 - FAX

The Choinumni Tribe of Yokuts
Rosemary Smith, Chairperson
1505 Barstow Choinumni
Clovis , CA 96311 Foothill YoKut
monoclovis@yahoo.com
559-862-5757

Traditional Choinumni Tribe
David Alvarez, Chairperson
391 Peach Avenue, #121 Choinumni
Clovis , CA 93612
(559) 324-8764
davealvarez@sbcglobal.net

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code. Also, federal National Environmental Policy Act (NEPA), National Historic Preservation Act, Section 106 and federal NAGPRA.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed Waste Treatment Plant Project; located in the City of Fresno; Fresno County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Applied EarthWorks Inc.

EXAMPLE

1391 W. Shaw Avenue
Suite C
Fresno, CA 93711
(559) 229-1856
FAX (559) 229-2019

April 13, 2010

David Alvarez
Traditional Choinumni Tribe
2415 E. Houston Avenue
Fresno, CA 93720

RE: Cultural Resources Inventory for Fresno Wastewater Treatment Plan

Your name and contact information were provided to Applied Earthworks, Inc. (Æ) by the Native American Heritage Commission (NAHC), which identifies you as an individual with knowledge of Native American resources in Fresno County.

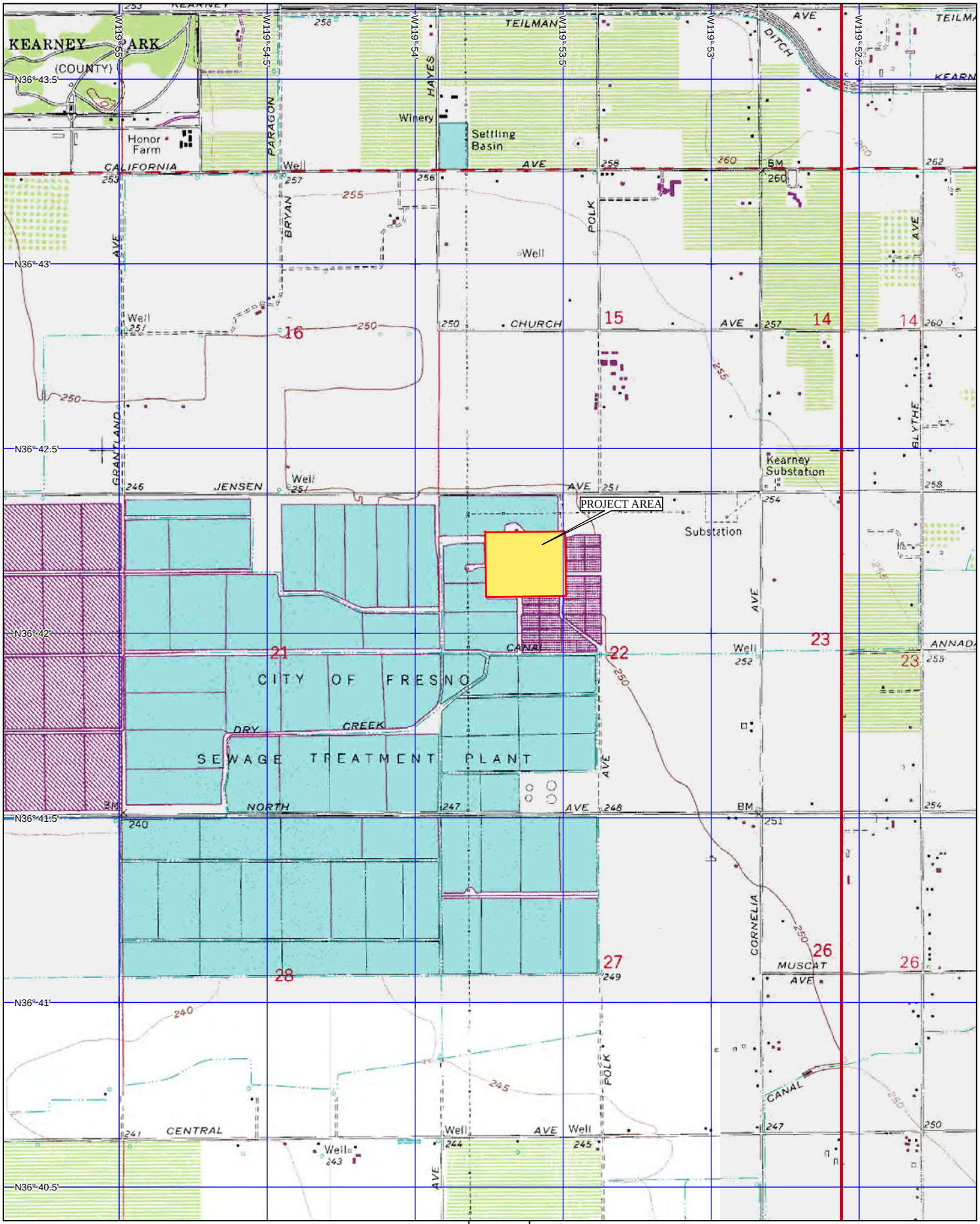
Æ is currently conducting a cultural resources inventory at the Fresno-Clovis Wastewater Treatment Plant. The plant plans to expand its dewatering facility by constructing annex to the existing building as well as a loading silo and new roads. The project will entail grading and utility trenching. Specifically, our study area lies within R19E, T14S, NW ¼ of Section 22 as shown on the Kearney Park, USGS quadrangle; it covers about 9 acres (see enclosed map). The record search identified one historical site north of the project area. In addition, archaeological monitoring conducted during a previous construction at the plant in 1997 encountered one historical and one prehistoric isolate. The prehistoric find was a basalt flake found in the backdirt spoil from excavation of an old pond; the flake appeared to have been re-deposited from its original context. The NAHC's sacred land files search did not indicate the presence of Native American cultural resources with a .5 mile radius of the project area. Æ's pedestrian survey of the exposed portions of the project area found no cultural resources.

If you have information regarding the study area, please phone me, send a letter or to my attention, or send an e-mail to rbaloian@appliedearthworks.com. Your comments will be included in our cultural resources inventory report. You can contact me during normal business hours (559-229-1856, ext. 23) if you have any questions or need additional information. Thank you.

Sincerely,

Randy Baloian
Project Administrator

Encl.



Paleontological Identification Report for the Fresno-Clovis Regional Wastewater Reclamation Facility Expansion Project, Fresno County, California

April 25, 2010

Prepared for MWH, Inc by:

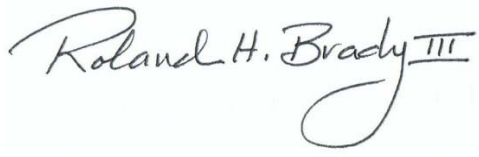
Brady and Associates
Geologic Services
brady_geology@msn.com

Paleontological Identification Report
for the
Fresno-Clovis Regional Wastewater Reclamation Facility
Expansion Project,
Fresno County, California

April 25, 2010

Prepared For:
MWH, Inc.
618 Michillinda Avenue, Suite 200
Arcadia, CA 910087
(626) 568-6286
Contact: Janet.l.fahey@mwhglobal.com

Prepared By:



Roland H. Brady III, Ph. D.

California Professional Geologist #5721
Brady and Associates Geological Services
2703 N. Adoline Ave.
Fresno, CA 93705
brady_geology@msn.com

SUMMARY

A. Purpose

Paleontological resources are the remains of scientifically important organisms, mainly vertebrates, that are older than 10,000 years (SVP, 1995). A project that may directly or indirectly significantly impact a unique paleontological resource or site is governed by a number of environmental regulations designed to protect these resources including California Environmental Quality Act (CEQA Appendix G, PRC 5097.5), Public Resources Code (PRC) 21000 (Division 13), California Code of Regulations (CCR) 15000 (Title 14, Chapter 3), and local County and City codes. Because the City of Fresno is the lead agency, CEQA and local environmental regulations must be followed regarding the assessment and treatment of potential paleontological resources.

This Paleontological Identification Report (PIR) was undertaken in compliance with CEQA, to assess whether potential that paleontological resources could underlie the Project site, and whether they could be damaged or destroyed by its construction and/or operation.

B. Location

The Project site lies 8 miles west of downtown Fresno, in Fresno County, in the San Joaquin Valley of California (Figs. 1, 2). The site is located in Section 22, Township 14 South, Range 19 East on the Kearney Park CA USGS 7.5-minute quadrangle, and is situated at latitude 36.704^{o} N north, and longitude -119.890^{o} W.

B. Project Description

The City is proposing to expand it sewage sludge dewatering facility by installing centrifuges to replace the present conveyor system. A new centrifuge building, loading silo and staging area with connecting roads will be built. According to information supplied by MWH Inc., the deepest excavation, for the silo foundation, will be approximately 10 ft; grading for the other facilities will be less than 1 ft. The total affected area is approximately one acre.

C. Site Description

The site is nearly square, level, and at an approximate elevation of 250 feet, and is nearly entirely overlain by asphalt paving and soil fill. Based on regional geologic mapping and studies, the site is underlain by several hundreds of feet of Pleistocene and younger stream, alluvial fan, and lake sediments, collectively mapped as “Quaternary alluvium” (Bartow, 1991; Croft, 1969; Croft and Gordon, 1969) from which significant paleontological resources have been recovered (Jefferson, 1991; UCMP, 2009 database).

D. Potential for Paleontological Resources at the Site

No significant paleontological resources have been reported within 1 mile of the project site, but important terrestrial vertebrate fossils have been recovered reported from the Modesto and Riverbank Formations 9 miles east of the site (PaleoResource Consultants, 2002). These units presumably underlie the Project site.

Upon examining the site at the surface and in the limited exposures in two trenches 350 ft south of the Project area, I conclude that the uppermost 3-4 ft consists of fill and highly disturbed Holocene alluvial soil, which would not contain significant paleontological resources. Below this is the Modesto Formation which has produced vertebrate fossils in the area.

Because of this, and a maximum design excavation depth of less than 1 foot, I would rate the surficial soil at the site as having “Low Sensitivity”. Deeper grading including excavation for the silo foundation would encounter the Modesto Formation which has "Moderate Sensitivity".

E. Conclusions and Recommendations

The uppermost soil at the site has "Low Sensitivity"; because of its young age, it would not contain vertebrate fossils. Where grading depth is less than 1 ft, paleontologic resources will not be encountered. However, where grading extends deeper than 2 ft, and where the silo foundation is excavated, potentially fossiliferous deposits of the Modesto Formation will be encountered. Although encountering fossils in this unit is unlikely, monitoring and possible salvage, both under the supervision of a Principal Paleontologist is required.

Assuming that this monitoring undertaken, and mitigation as suggested herein is undertaken in the unlikely event that that vertebrate fossils are encountered, the Project's impact on paleontological resources should be "Less than significant with Mitigation".

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A. Paleontological records search, LACM.
B. Geological time scale

Section 1 Introduction

1.1 Purpose of the Study

This Paleontological Identification (study) Report (PIR) of the proposed Fresno-Clovis Regional Wastewater Reclamation Facility expansion project site is undertaken in response to State (CEQA) and local environmental regulations to protect significant paleontological resources during construction and operation. Specifically, it evaluates whether significant paleontological resources could be encountered at the project site, and whether construction or operation could adversely affect the resources.

1.2 Location and Project Description

The Project site covers an area of about one acre in Section 22, Township 14 South, Range 19 East on the Kearney Park CA USGS 7.5-minute quadrangle (36.704^{o} N latitude and -19.890^{o} W longitude) in Fresno County, California. The site lies 1 1/4 mile southeast of Kearney Park. The site lies 7.5 miles west of Highway 99, and is bounded on the north by Jensen Ave., to the south by W. North Ave., the east by Cornelia Ave., and on the west by Hayes Ave. (Fig 3.). The property is entirely owned by the City of Fresno (Figs. 1 and 2), and is an extension of the present facility.

The Project site is a nearly level field, mostly paved with blacktop, at an elevation of approximately 250 feet. It covers approximately 1260 sq. ft. extending north and east from existing facilities (Figs. 3, 4, and 5). The Project consists of constructing a new building to house a centrifuge and a loading silo, expanding the staging area, and grading supporting roads. The deepest excavation, for the silo foundation, will be about 50 ft in diameter and 10 ft deep. All of the other grading would be 1 ft or less.

1.3 Previous Geologic/Paleontologic Studies

Croft and Gordon (1968), Croft (1969), and Bartow (1991) reviewed the overall geologic setting of the area. Marchand and Allwardt (1976; 1981) mapped Late Cenozoic sedimentary units north of the San Joaquin River, but their work is seminal in defining the soils associated with fossil-bearing units. Jefferson (1991) and the University of California Museum of Paleontology

(UCMP), and the Los Angeles County Museum (LACM) data bases catalog fossil localities in the area.

1.4 Laws, Ordinances, Regulations, and Standards

This Paleontological Identification Report (PIR) was contracted to provide site surveys needed to comply with State and local environmental regulations to protect paleontological resources. Since the City of Fresno is the lead agency for the Project, California Environmental Quality Act (CEQA) and local regulations must be followed.

Paleontology is the study of life in past geologic time based on fossil plants and animals. Fossils furnish information about the kinds of plants and animals that existed, when they appeared and vanished, where and how they lived, and the type of environments they preferred. Fossils help us learn how species evolved, how some descended from others, and how groups of organisms are related. Because of their rarity and scientific importance, vertebrate fossils such as exist in the Southern San Joaquin Valley region, are protected by law.

1.4.1 State Laws and Regulations

Under California law, CEQA requires that a study be undertaken to assess the potential that paleontological resources exist at the site, and whether construction and/or operation would damage these resources.

If paleontological resources are identified as being within the proposed project area, which is public land, the lead agency (in this case, the City) must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource.

CEQA Guidelines requires that public agencies identify the environmental consequences of their proposed projects on any object or site of significance to the scientific annals of California. Paleontological resources are also protected by the California Code of Regulations (CCR), Title 14, Section 4306 et seq., and Public Resources Code (PRC) Section 5097.5.

CEQA Sections 21000 et seq. of the PRC with Guidelines for implementation codified in the CCR, Title 14, Chapter 3, Sections 15000 et seq., requires state and local public agencies to identify the environmental impacts of proposed discretionary activities or projects, determine if

the impacts will be significant, and identify alternatives and mitigation measures that will substantially reduce or eliminate significant impacts to the environment. State-owned properties are also subject to the provisions of PRC Section 5024 and 5024.5.

CCR Section 15063, Appendix G of the CEQA Guidelines provides an Environmental Checklist of questions that a lead agency should address if relevant to a project's impact on significant paleontological resources. Section V, Part (c) asks:

> *"Would the project directly or indirectly destroy a unique paleontological resource or site…?"*

Section XVII, part (a), inquires:

> *"Does the project have the potential to..... eliminate important examples of the major periods of California .....pre-history?"*

Any object which the lead agency determines to be "significant" in the scientific annals of California is protected by CEQA 15064.5 (a) (3) (A, D) if it (D) *"Has yielded or may be likely to yield, information important in prehistory…"* The lead agency, in this case, the City of Fresno has recognized paleontologic resources as being significant (see below).

CEQA Appendix G also states that the extent of impact on the resources must be identified as being "*Potentially significant, Less than significant with mitigation, Less than significant, or No impact"*. If the impact is either "Potentially significant" or "Less than significant with mitigation", a Paleontological Mitigation Plan (PMP) must be designed and implemented to protect significant fossil resources.

CEQA Section 21081.6, entitled "Mitigation Monitoring Compliance and Reporting", requires that the lead agency (in this case, the City of Fresno) adopt a monitoring and reporting program to ensure compliance with mitigation measures developed during the **e**nvironmental impact review process during a project's construction and operation.
California Public Resources Code 5097 also protects vertebrate paleontological sites, including fossilized footprints or any other paleontological features situated on state lands.

> *"No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any….paleontological site…..or paleontological feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor".*

Fresno County and the City of Fresno recognize the value of paleontological resources and have well defined policies for protecting these during construction (Fresno County General Plan, Goal 11).

1.4.2 Local Laws, Policies, and Regulations

The Fresno County General Plan also recognizes the value of paleontological resources and has well defined policies for protecting them. Policy OS-J.1 states:

> *"The County shall require that discretionary development projects, as part of any required CEQA review, identify and protect important….paleontological… sites and their contributing environment from damage, destruction, and abuse to the maximum extent feasible. Project-level mitigation shall include accurate site surveys, consideration of project alternatives…. and provision for resource recovery and preservation when displacement is unavoidable".*

The City of Fresno General Plan (Valley Planning Cnsultants, 2002) also recognizes the value in protecting paleontological resources. Section G-6 Goal 11 states that The City shall *"Protect, preserve and enhance significant ….paleontological resources…."* And Policy G-10-c states that:

> *"Unique prehistoric resource sites shall be considered as those ..… paleontologial sites which contain information needed to answer important scientific research questions, have special quality or unique features.…or are directly associated with a scientifically recognized prehistoric….event."*

1.4.3 Definition of "Significance"

In its standard guidelines for assessing and mitigating adverse impacts to paleontological resources, the Society of Vertebrate Paleontology (SVP) (1995) noted that a **fossil specimen** is considered to be "**significant**" (having scientific importance) if it is:

1) identifiable, 2) complete, 3) well preserved, 4) age-diagnostic, 5) useful in paleoenvironmental reconstruction, 6) a type or topotypic specimen, 7) a member of a rare species, 8) a species that is part of a diverse assemblage, or 9) a skeletal element different from, or a specimen more complete than, those now available for that species.

The value or importance of different fossil groups varies depending on the age and depositional environment of the stratigraphic unit that contains the fossils, their abundance in the record, and their degree of preservation. The SVP (1995) considers all vertebrate fossils "***scientifically significant***" because they are so uncommon and only rarely will a fossil locality yield a statistically significant number of specimens of the same species. So, each fossil specimen found provides important information about the characteristics or distribution of the species it

represents. Fossil plants, unlike animals, are not mobile and are highly climatically diagnostic, so are particularly useful for paleoenvironmental reconstructions, and therefore, may be "scientifically significant" as well.

CEQA defines a "**significant effect"** as "*A substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the proposed activity.*" Appendix G (Part V) describes "**significant impacts**" on paleontological resources as being those that "*disturb or destroy a unique paleontologic resource or site or unique geologic feature".*

1.4.4 Definition of "Sensitivity"

A **stratigraphic unit** (a formation, member, or bed) known to contain significant fossils is considered to be "**sensitive**" if earth-moving or ground-disturbing activities could disturb or destroy fossil remains in that unit (SVP, 1995). Paleontological "sensitivity" of a stratigraphic unit is based on its potential paleontological productivity, and the scientific significance of the fossils it has produced. In its standard guidelines for assessing and mitigating adverse impacts to paleontological resources, the SVP (1995) established three categories of sensitivity for paleontological resources:

> **High:** All vertebrate fossils are categorized as having significant scientific value, and all stratigraphic units in which vertebrate fossils have previously been found. Full-time monitoring is recommended during any project-related ground disturbance.
>
> **Low:** Stratigraphic units that have not been known to produce fossils in the past. Monitoring is usually not recommended nor needed during excavation in a stratigraphic unit with low sensitivity.
>
> **Undetermined:** Stratigraphic units that have not had any previous paleontological resource surveys or any fossil finds are considered to have undetermined sensitivity. After reconnaissance surveys including observations of road cuts, stream banks, and possible subsurface testing such as augering or trenching, an experienced, professional paleontologist can often determine whether the stratigraphic unit should be categorized as having high or low sensitivity.
>
> To these, the following are added herein:
>
> **Moderate:** Geologic formations known to rarely produce vertebrate fossils, but are of scientific value. Monitoring is recommended during excavation.

None: Sedimentary strata too young (<10,000 years) to contain fossils, or most lavas, intrusive igneous rocks, and mid- and high-grade metamorphic rocks in which fossils do not exist.

Unlike the boundaries of archaeological sites which define an areal extent of the resource, the entire volume (both areal and vertical dimensions) of a fossiliferous formation has paleontologic potential, and therefore, "sensitivity" (SVP, 1995). This allows different levels of paleontological sensitivity to be indicated on a topographic or geologic map, based on the underlying geologic formations.

Section 2 Scope of Study

2.1 Study Methods

A Phase I Paleontological Identification Report (PIR) such as this, is the initial and least extensive of several studies that could be required as a condition of project permitting, aims to identify fossils and fossil-bearing units that could occur at a site.

Vertebrates are the most "significant" fossils likely to occur at the Project site. Vertebrate fossils are an integral component of the rock unit, including its extension below the ground surface. Since fossils tend to be non-uniformly distributed within a rock unit, commonly there is no surface evidence that they exist at depth. Often, a geologist cannot know either the quality or quantity of fossils present at a potential construction site before the rock unit is exposed by erosion or human earth-moving activities. So, the geologist/paleontologist must assess the *potential* for impact based upon fossils recovered from the same rock unit in the region, and make a judgment on whether fossils were likely to have been preserved by the depositional environment of the sediments that compose the rock unit in the construction site. Therefore, a rock unit at a project site that has no exposed fossils would be assigned a level of sensitivity equal to the same rock unit nearby that has produced fossils, and has a similar type of sediment.

This PIR examines the project area's geology, stratigraphy, and potential for significant paleontological (fossil) resources; and assesses whether construction or operation of the project could damage them. This study includes: 1) examining published and unpublished maps, aerial photography, and reports; 2) consulting with on-line databases, and 3) conducting a reconnaissance site visit. The geological descriptions herein are intended solely to clarify potential the paleontological resources, and do not include information data for design or geotechnical purposes.

To complete this PIR, I reviewed geologic, paleontologic, and legal literature from: 1) California State University-Fresno, 2) City and County of Fresno, and 3) California Department of Transportation (Caltrans) District 11 office including:

- State (CGS) and Federal (USGS) publications.
- Scientific journals.

- University of California Berkeley Museum of Paleontology (UCMP) and Los Angeles County Museum of Natural History (LACM) paleontological databases
- Unpublished consulting reports (EarthMetrics, 1990; Dames and Moore, 1996; Kleinfelder, 2007; URS Inc. 2000).
- Paleontologic Evaluation Reports and Paleontologic sensitivity maps of nearby transportation corridors.
- State, County, and City environmental regulations.

The mitigation measures suggested herein were approved by Dr. Robert Dundas, Principal Paleontologist.

2.2 Preparer's Qualifications

Assessing the significance of a project's impact on paleontological resources requires that the geologic strata that could be affected by excavation be correctly identified, and the extent of a project's impact be assessed accurately. Doing so involves professional investigation, analysis, and interpretation of the project area's geology and paleontology. The California Business and Professions Code, Chapter 12.5, requires that geologic reports prepared for public decision-making documents, such as this PIR, be prepared by or overseen by a licensed California Professional Geologist.

This PIR was prepared by Dr. Roland H. Brady III, Ph.D., California Professional Geologist No. 5721. Dr. Brady received his Ph.D. from U.C. Davis in Geology/ Geophysics, and has more than 30 years of geological experience mapping and interpreting sedimentary rocks in California, the western US, and overseas. He is an Emeritus Professor from the Geology Department California State University-Fresno, has undertaken, participated in, or reviewed numerous paleontological studies; is widely published in peer-reviewed journals; and has completed many geologic studies for private and government entities. Mitigation measures were approved by Dr. Robert Dundas, Principal Paleontologist.

2.3 Document Standards

California requirements for paleontological studies are outlined in Title 20, California Code of Regulations, Section 2012 and in Caltrans Standard Environmental Reference (2007), Volume 1, Chapter 8 – Paleontology. This report follows those professional standards for content and format.

2.4 Limitations

The conclusions and recommendations of this PIR are valid so long as the project footprint and limits of excavation remain as described herein. Should the Project's footprint or excavation depths be increased, a comprehensive Paleontological Mitigation Plan prepared by a Principal Paleontologist following State guidelines would be required.

Section 3 Regional Geology and Paleontology

3.1 Regional Geologic Overview

The project area lies within the central San Joaquin Valley, which forms the southern part of the 700-km-long Great Valley physiographic province of California, between the Sierra Nevada mountain range to the east, and the Coast Range to the west (Fig. 1). The San Joaquin Valley is a westward- and southward-deepening, asymmetric structural synclinal trough filled with up to 8 km of Upper Mesozoic and Cenozoic sedimentary strata resting on a basement of metamorphic and igneous bedrock (Bartow, 1991; CGS, 2002 Note 36).

Both plate tectonics and sea level changes affected sedimentary deposition in the region, producing numerous facies changes and hence, paleontologic environments. The oldest vertebrate fossil-bearing units, are Mesozoic in age. They are uplifted and exposed on the west side of the San Joaquin Valley, but exist at great depth beneath it, at the project site, being overlain by up to 4,500 meters of nearly flat-lying Cenozoic marine and non-marine strata (Bartow, 1991; Marchand and Allwardt, 1981).

During Pleistocene time, the San Joaquin Valley was surrounded by glaciated Sierra Nevada to the east, and the low-lying Coast Ranges to the west. Mammals such as wooly mammoths, giant ground sloths, cave bears, saber-tooth cats, camels, horses the size of dogs were common. Drainage along the ancient Kings River alluvial fan and floodplain carried sediment westward from the Sierra Nevada, and supplied most of the water to ancient Corcoran Lake which gradually receded until its disappearance about 0.6 Ma, probably as a result of northward drainage along the San Joaquin River into the Carquinez Straits (Bartow, 1991). Later, the ancestral Kings River was a major source of water to Tulare Lake which was once one of the largest lakes in California and was an important ecological habitat during the Pleistocene (Croft, 1969; Marchand and Allwardt, 1981). The modern Kings River alluvial fan is large and nearly level, its surfaces are cut by shallow, meandering sloughs and creeks, most of which have been filled and farmed or built over.

As a result of these geological processes, the region around the project area is underlain by undifferentiated “Quaternary sediments” (Bartow, 1991) - a vague and general designation that

includes numerous stratigraphic entities. Marchand and Allwardt (1981) sub-divided the Quaternary sediments of the southern San Joaquin Valley into discrete formations, and interpreted their depositional setting. Since this type of work has yet to be undertaken in the Southern San Joaquin Valley, identifying and understanding potential for paleontological resources here is more difficult and uncertain.

3.2 Regional Stratigraphy

The central San Joaquin Valley is underlain by several hundreds of feet of Pleistocene and Holocene stream, alluvial fan, and lake sediments, collectively mapped as “Quaternary alluvium” (Bartow, 1991; Croft and Gordon, 1968; Croft, 1969; CDMG, 1991). Although Holocene deposits are too young, by definition (<10,000 years old) to contain fossils, (SVP, 1995) underlying Pleistocene units at the site have the potential to contain significant vertebrate fossils.

Identifying Holocene- from Pleistocene-aged deposits is critical to this study. Marchand and Allwardt (1981) mapped three, extensive, Pleistocene alluvial units--the Modesto, Riverbank, and Turlock Lake Formations--and "post Modesto" Holocene deposits as far south as Fresno. All undoubtedly underlie the project area, and have yielded significant vertebrate fossils.

Because these units were all derived from the same sediment source in the Sierra Nevada, and were all deposited in similar alluvial fan environments, they are very similar in appearance and difficult to distinguish from one another. However, the soils that formed on the older units have time-dependent characteristics that allow them to be differentiated from the progressively younger soils on the younger units. The most diagnostic is the B soil horizon which is most dissimilar from the parent material (sediment) and contains characteristics notable in the field (summarized in Table 2). Thus, the extent of development of the soils' B horizons can be used to differentiate among the Holocene and progressively older Pleistocene units (Marchand and Allwardt, 1981; Hardin, 1982, 1987). I have also summarized the characteristics of the formations and their fossil potential in Table 3 using information from Marchand and Allwardt (1981), USDA (1986), Jefferson (1991), and the UCMP database. Geologic units underlying the site are described below from youngest to oldest as they would appear in an excavation.

3.2.1 Post-Modesto Alluvium

Holocene, post-Modesto alluvium up to 30 feet thick, deposited in river terrace, lake, and fan environments, overlies the Pleistocene units throughout most of the central part of the southern San Joaquin Valley. Three ages of deposits are recognized with significant time gaps between them. The youngest are modern to a few hundreds of years old, while the oldest may be as old as 8,300 years (Marchand and Allwardt, 1981; Hardin, 1987). Although early man sites up to 8,200 years old have been identified in this unit during high stands of Tulare Lake (Marchand and Allwardt, 1981 p. 62), it is too young to contain fossils which are defined as being older than 10,000 years (Jefferson, 1991).

The oldest, post-Modesto deposits bear pale colored, weakly developed, A/C soil profiles such as the Tujunga and Grangeville series (Table 4), (USDA, 1971).

3.2.2 Modesto Formation

The Modesto Formation totaling 115 feet at its type section consists of alluvial fan sand and gravel; aeolean sand; and fine-grained, basinal deposits. The unit is divided in to two members (Marchand and Allwardt, 1981). The upper member (33 ft) is eroded in most exposures so its youngest age is uncertain (8,000-9,000 years, but it may be as old at 27,000-29,000 years at its base.

The best developed soils on the upper member of the Modesto Formation have thick A/C or weak cambic B horizons with overly oxidized C horizons such as the Pachappa, and Hanford series. B horizons are 10YR-7.5YR 4/. In the B horizon, clay coatings are thick, and there is a moderately developed, fine to coarse subangular blocky structure Marchand and Allwardt, 1981).

The lower member (82 ft thick) is largely covered by the upper member and Holocene younger deposits in the Fresno area and southward. It consists mainly of sand and stratified silty sand representing distal fan, lake, and aeolean deposits, and fluvial gravel. Unlike other units, the lower member contains abundant andesitic- and metamorphic-derived detritus (Marchand and Allwardt, 1981)--a useful stratigraphic marker. The maximum age of the lower member is equivocal but is tentatively assigned an age of 40,000 years (Hardin, 1987).

Soils on the lower member vary, but have weakly to moderately developed Bt horizons with 10YR to 7.5YR hues. Structure is moderate to strong, subangular blocky; clay films fill pores and coats clasts, but are absent on ped surfaces. Typical soils include the Borden, Greenfield. In

finer grained facies (due to poor drainage), soils have calcium carbonate-silica-iron duripans and well developed Bt horizons, resembling those common in the underlying Riverbank Formation (Marchand and Allwardt, 1981).

3.2.3 Riverbank Formation

The Riverbank Formation consists of arkosic sediment eroded from the interior of the Sierra Nevada. The unit unconformably underlies the Modesto Formation along most of the eastern San Joaquin Valley, and cuts into or truncates the underlying Turlock Lake Formation (Croft, 1969; Croft and Gordon, 1968). The Riverbank Formation was deposited in prograding alluvial fan complexes and is 41.5 feet thick at its type section. Mostly arkosic sand, it coarsens upward and contains minor gravel near the top. The Riverbank Formation is 130,000 to 450,000 years old, representing the Illinoisian-Wisconsinian glacial periods. Three members are recognized with pronounced unconformities (and soils) between them.

The upper unit represents a single, aggradational unit topped by a gravel bed, and has Ramona and Madera soils. The Ramona soil has a thin Bt horizon with weakly developed structure and discontinuous clay films. Madera soils have more extensively developed Bt horizons, moderate blocky structure, thick clay films, brown color (7.5 YR 4/4), and a strngly developed, reddish Bqm duripan often with carbonate seams.

The middle unit is aggradational, sandy alluvium, and is extensively preserved. Formed on the middle member are Snelling and San Joaquin soils. Both have well developed Bt horizons (extensive clay films and blocky structure). The Snelling B horizons are 7.5YR 4/-6/ while those in the San Joaquin are 10YR 4/-6/). The latter also has a strong, silica-iron duripan with a distinctive platy structure at its top.

The lower unit is rarely exposed and largely eroded away. Soils have reddish cambic B horizons and weak calcareous silica-iron duripans. Ramona and San Joaquin soils in the Fresno area include thick, reddish-brown (2.5YR 4/4m) Bt horizons with distinct and continuous clay films on ped surfaces. The San Joaquin soil has fully developed Bqm duripan.

3.2.4 Turlock Lake Formation

The Turlock Lake Formation is the oldest unit described herein. Its base is older than 730,000 years, being paleomagnetically reversed (Dundas and others, 1996), while its upper part is estimated to be about 600,000 years (Marchand and Allwardt, 1981). It was deposited in a

complex of alluvial fans and short-lived lakes and is over 1,000 ft thick at its type section. Volcanic eruptions in the Sierra Nevada are recorded by the Corcoran clay and Friant ash form important marker beds for the unit. The unit was eroded, forming well developed soils, and then unconformably overlain by the Riverbank Formation.

In terms of its lithology and internal structure, the Turlock Lake Formation is often indistinguishable from the overlying Riverbank and Modesto Formations. However, it has the most well developed soils, usually over 10 ft thick, having well developed B horizons expressed by the dark red-brown color (2.5YR 6/-8/), strong subangular blocky to prismatic structrure, moderately to continuous clay films, and presence of well developed Bqm duripans, in places stripped of their carbonate.

3.3 Fossils in the Region

By definition, since fossils are older than 10,000 years (SVP, 1995). Pleistocene-aged strata have the potential to contain vertebrate fossils, most significantly, mammals. The Pleistocene epoch, known as the "Great Ice Age," began approximately 1,800,000 years ago. Vertebrate non-marine fossils are divided into two major stages: the older Irvingtonian (1,800,00 to 300,000 ybp, and the younger Rancholabrean (300,000 to 11,000 ybp) which are part of the North American Land Mammal Ages chronology (CGS, 2002b, Note 51).

Irvingtonian-stage mammals include peccaries, bone-crushing dogs and related carnivores, saber-toothed cats, proto-horses, mammoths, and gomphotheres, "elephant-like" animals. The Rancholabrean stage is based on the presence of bison which entered the North American continent from Asia, but also on other large mammals such as mammoths, mastodons, camels, horses, and ground sloths, and some species that are alive today.

Quaternary sedimentary deposits in the area are generally ranked as having "low sensitivity" paleontologically. For instance, the CSUF (2000) paleontological sensitivity map and database ranks the "Quaternary alluvium" along the Highway 180 transportation corridor north of the Project site, as being of "low sensitivity" because of the low probability of encountering vertebrate fossils of scientific interest in the upper few feet of section. "Low" or "insignificant" sensitivity is consistent with other paleontological assessments undertaken in the Fresno area (Earth Metrics, 1990; Dames and Moore, 1996; Kleinfelder West, 2007). However, fossils of important land mammals have been found at a number of localities in the San Joaquin Valley

region in Pleistocene alluvial units of the Modesto, Riverbank, and Tulare Lake Formations (Jefferson; 1991).

3.3.1 Fossils in the Modesto Formation

Rancholabrean camel (*Camelops* sp.*)* limb bones were recently discovered in the Modesto Formation during excavation of the impound basins along the Highway 180 corridor in southern Fresno (PaleoResource Consultants, 2009). Other vertebrate fossils from the unit are described in Jefferson (1991), and the UCMP database. Records search of the LACM database (Appx. 1) noted that their fossil location (LACM 7274) closest to the Project site is just northeast of Chowchilla where elephant (Proboscidea) fossils were recovered, probably from the Modesto Formation.

3.3.2 Fossils in the Riverbank Formation

Riverbank sediments recently exposed during excavation of the impound basins along the Highway 180 corridor in southern Fresno also yielded Irvingtonian vertebrate fossils including mammoth (*Mammuthus meridionalis)* vertebra, pelvic bones, jawbones, ribs, teeth, and limb bones. These bones were important, being the first recovered in central California, and the youngest in the state (PaleoResource Consultants, 2009).

Tranquility site (UCMP V-4401) in Fresno County, approximately 25 miles west of the Project site has yielded more than 130 Rancholabrean-age fossils including fish, turtles, snakes, birds, mammoths, mastodons, bison, horses, camels, antelope, deer, moles, gophers, mice, wood rat, voles, jack rabbits, coyotes, red fox, grey fox, badgers, and pronghorn (UCMP database).

Pleistocene sediments (Riverbank Fm.?) have produced Rancholabrean- age fossil horse specimens in at least two localities in Tulare County to the south (UCMP 3931and 6837). Other fossil remains including coyotes, deer, sloths, bison, pronghorns, squirrels, and reptiles have been recovered from the unit (Jefferson, 1991; Hilton and others, 2000; UCMP database)

3.3.3 Fossils in the Turlock Lake Formation

An extensive deposit of Irvingtonian-Pleistocene (750,000 y.b.p. maximum) vertebrate fossils was discovered at the Fairmead landfill site in Madera County some 30 miles north of the project site, where mammoth, horse, deer, turtle, wolf, giant ground sloth, bear, occur in the upper

Turlock Lake Formation, approximately 36 to 46 feet below the ground surface (Dundas and others, 1996).

3.3.4 Summary

The existence of these localities indicates that significant vertebrate fossils can occur in any of the three, Pleistocene alluvial units. Significantly important terrestrial vertebrate fossils have been reported from Quaternary alluvium within 10 miles of the site including mammoth, giant ground sloth, camel, bison, horse, wolf, and rodents (Jefferson,1991; UCMP, 2009 database).

Section 4 Project Site Geology and Paleontology

4.1 Site Description

The project site is nearly level, one-acre plot at an approximate elevation of 250 feet within the in the City of Fresno. Most is covered by asphalt and fill (Figs. 3, 4, and 5).

4.2 Geology and Soils

There are no maps of sufficiently large scale to clearly show the geology underlying the Project site, but evidence indicate that the Project site is situated on Holocene sediments overlying the Modesto Formation which is Pleistocene in age.

The 1:250,000-scale Fresno geologic quadrangle (CGS, 1991), indicates that the Project site is underlain by Quaternary alluvium (Qf) of Holocene age. Slightly to the east is a body of undifferentiated Pleistocene sediments (Qc). But, the map's small scale precludes precise identification of the units. Although Marchand and Allwardt's (1978) 1:125,000-scale map stops 8 mi north of the Project area, it indicate the presence of widespread deposits of the late Pleistocene Modesto Formation due north and east of the facility. Fisk and Mahan's (2009, Figure 3) sketch map indicates that the Modesto Formation extends along the Highway 180 corridor west of Olive Avenue in Fresno. This agrees with descriptions of the Modesto Formation in Weissmann, Bennett, and Fogg (2003) who show (their Figure 2-2) Modesto Formation extending west of Highway 99 from Sanger toward western Fresno.

Surficial soils directly underlying the Project site are mapped as mainly Atwater series (AoA). Extensive bodies of Hesperia (Hst) lie to the south, with smaller tongues of Pachapa (Pd) and Madera (Ma and Mc) to the east (USDA, 1971, Sheet 60). All formed on granite-derived sediment deposited on alluvial fans along the ancestral San Joaquin River

Atwater soils are described as being deep, coarse-to-moderately textured soils that formed on stabilized sand dunes, commonly on the lee side of channels (USDA, 1971). USDA describes the A horizon is up to 24 inches deep and is dark yellowish brown. The Bt horizon extends from 24 to 42 inches, is dark brown when moist (7.5 YR 4/2, 4/4 (moist), has a weakly developed coarse blocky structure, is slightly sticky, and has few clay films on ped surfaces.

Hesperia soils are young, alkaline and in places salt affected, A-C profiles. Typical pedons are up to 6.25 feet thick. They are light brownish gray to gray. The C horizon is structureless, friable, and contains variable amounts of lime.

Pachappa soils have a Bt horizon 1.5 to 2.5 ft thick, brown to yellowish brown (10YR 5/3), clayey, (very sticky when wet, hard when dry), with a moderate subangular blocky structure, and common clay films in pores and on ped faces.

Madera soils are grayish brown to dark brown. The Bt horizons have a hard, blocky structure with abundant clay films, while the Cm is moderately to strongly cemented, dark reddish brown, lime-iron-silica duripan ("hardpan") up to a foot thick. This soil was recognized at the Fairmead landfill site as representing the top of "Unit A", forming the upper unit of the Riverbank Formation (Dundas and others, 1996).There, fossils occur in the Turlock Lake Formation, a minimum of 32 feet beneath the Merced soil.

Marchand and Allwardt (1978) indicate that the Atwater soil series (which the USDA map shows at the site) is associated with the lower Member of the Modesto Formation. According to this work, the upper Member of the Modesto Formation ("m2") is associated with Hesperia soils (Hst) that cover large areas immediately to the south (Fig. 7).

4.2.1 Site Reconnaissance

A 3-hour reconnaissance was conducted on 4/6/2010 to examine the site, particularly the soils and geology. Although most the site was either paved with blacktop or covered by grass and existing buildings, the substrate was exposed in two, 7-ft deep pipeline trenches located along the axis of the proposed silo and 350 ft south of the proposed expansion. Access to trenches was restricted, but they were sufficiently wide to give fairly clear views of their walls, and the spoils were being dumped onto an adjacent pile, so hand samples were available there.

Inspection of the Soil Trench

The upper 2.7 ft of the trench is brownish gray, clayey fill having fragments of glass and plastic. This fill is typical of other exposures such as in the berm of Polk Ave. along east side of the Project site. Underlying the fill is from 2.0 to 3.2 ft of medium gray-brown, well sorted, crudely cross bedded, loose sand filling a channel 1.2 ft deep. No soil horizons were noted in the sand.

Underlying the sand and extending to the bottom of the pit (7 ft) is weakly stratified fine sand and silty sand with two soil horizons. The upper has a Bt 0.4-0.6 ft thick, is 5YR 4/6 isn color,

and slightly clayey. The lower soil has a hard, blocky structure, is strong brown (5YR 5/6) in color, and has abundant clay films. No duripan, or carbonate seams are present in either soil.

The uppermost 2.7 ft is clearly fill. Based on its grain size, cross bedding, and lack of B soil horizon, the sand underlying the fill (from 2.0 to 3.2 ft) is most likely Holocene dune deposits. Post-Modesto soils, of which there are several in the region, are described as variants on the A-C profile, too young (10,000 years) to have well developed Bt soil horizons (Marchand and Allwardt, 1981), and hence, too young to contain fossils.

The lowermost unit is probably the upper member of the Modesto Formation. The two soils have well developed Bt horizons similar to Atwater soils described by Marchand and Allwardt, 1981 as being associated with the Modesto Formation.

Inspection of Fill

Fill material is quite common throughout the site. It composes the berm of Polk Avenue, and is spread in a number of places north and south of the Project site. For the most part, the fill is dark brown, silty sand with minor clay, so appears to have been excavated from depth. Nowhere did I notice any bone or tooth material in the fill.

4.2.2 Summary

Although the USDA soil survey indicates that Atwater soils underlie the site, Taken collectively, published geologic and soils maps, and soil trench log indicate that that the Project site is situated on Holocene sediments overlying the Modesto Formation which is Pleistocene in age.

4.3 Potential for Fossils at the Project Site

As noted in the section above, the Modesto Formation has yielded important Pleistocene fossils from several localities, but none within 10 miles of the Project site.

I would rate the Modesto Formation underlying the site as having “Moderate Sensitivity”. The uppermost several feet of soil is most likely to be fill and Holocene sand, and most of the grading is planned to be less than 1 foot deep. If fossils exist at the site, they are below the planned maximum grading depth, so will not be disturbed.

However, excavation for the silo is planned to be up to 10 ft deep, extending into the Modesto Formation, so there is a potential that paleontological resources could be encountered. It is unlikely, though, because the cut would occupy such a small area, only about 50 ft across.

Section 5 Potential Impacts

5.1 Construction-Related Impacts

After examining the site at the surface, and in the soil trenches, I conclude that the uppermost several feet of material at the project site is fill and Holocene soil less than 10,000 years old. Because by definition, organic remains must be older than 10,000 years old to be considered as fossils, the upper 2-3 feet would contain no paleontologic resources and would be considered to have "Low Sensitivity". However, excavation for the silo is sufficiently deep that it will extend into the Modesto Formation, assigned a "Moderate Sensitivity", and therefore, could encounter paleontological resources.

Provided that the monitoring described in Section 6 is followed, potential impact on paleontological resources should be considered as "Less than significant with mitigation".

5.2 Cumulative Impacts

No cumulative impacts are anticipated from the construction or operation of the Project.

5.3 Land Ownership/Permits Required

The project site is owned by the City of Fresno. If paleontological specimens are encountered and collected at the site during mitigation, they become property of the City and should be properly curated at an approved facility (local to the project location or a museum) and preserved for future research.

Section 6 Recommendations and Mitigation

No further studies are necessary provided that the Project footprint remains unchanged and excavation depths are as described above. However, excavation for the silo foundation has the unlikely potential to encounter fossil resources and therefore, should be monitored by a qualified professional having the authority to halt further work until assessment and/or appropriate salvage of the fossils is undertaken. The following measures would address potential impacts to paleontological resources and reduce impacts to a "Less than Significant with Mitigation" level:

6.1 Retention of a Principal Paleontologist

Consistent with Federal and State law, if fossils are discovered during grading, an approved Principal Paleontologist must be called to the site to develop mitigation measures to protect those resources. Before construction-related earthmoving activities and excavation at depths of 2 feet below the surface (into the Modesto Formation), the services of a qualified Principal Paleontologist should be retained and consulted. Based on the information in this PIR, the Paleontologist shall determine when and where monitoring will be required, and who will conduct it.

6.2 Preconstruction Coordination and Training

The Paleontologist or another mitigation program staff member shall coordinate with appropriate construction contractor personnel to provide information regarding applicable requirements concerning protecting paleontological resources. Contractor personnel, particularly heavy-equipment operators, shall also be briefed on procedures to be followed in the event that fossil remains and a currently unrecorded fossil site are encountered by earthmoving activities, particularly if a paleontological construction monitor is not on the site. Additional briefing shall be presented to new contractor personnel as necessary. Names and telephone numbers of the monitor and other appropriate mitigation program personnel shall be provided to appropriate contractor personnel.

6.3 Paleontological Monitoring and Fossil and Sample Recovery

When required, monitoring shall consist of visually inspecting freshly exposed cuts into the Modesto Formation, and spoil piles for the discovery and recovery of larger fossil remains, and periodically dry test screening to allow for the discovery and recovery of smaller fossil remains. If larger vertebrate fossils are noted by construction workers or monitors, excavation there will cease, and the monitor will be notified. The monitors will then notify the Principal Paleontologist.

The monitor and recovery staff will salvage all larger vertebrate fossil remains, as soon as practicable and as quickly as possible, under the supervision of the Principal Paleontologist following Society of Vertebrate Paleontology (1995) and State (Caltrans, 2007) guidelines. The monitor shall document the location and proper geologic context of any recovered fossil occurrence or rock or sediment samples. Any recovered rock or sediment sample from the Modesto Formation shall be processed to allow for the recovery of smaller fossil remains that normally are too small to be observed by the monitor. Pursuant to Society of Vertebrate Paleontology (1995) standard measures, no more than 6,000 pounds (12,000 pounds total) of sediment need be processed from the Modesto Formation.

If the Paleontologist or monitor determines that the fossil site is too unproductive or the fossil remains not worthy of recovery by the monitor, no further action will be taken to preserve the fossil site or remains, and earthmoving activities shall be allowed to proceed through the site immediately.

6.4 Final Laboratory Tasks

All fossil specimens recovered from the Project area as a result of mitigation, including those recovered as the result of processing rock or sediment samples, will be treated (i.e., prepared, identified, curated, catalogued) in accordance with designated museum repository requirements. Rock or sediment samples will be submitted to commercial laboratories for microfossil, pollen, radiometric dating, or other analysis, as appropriate.

6.5 Reporting

The monitor shall maintain daily monitoring logs that include the particular

tasks accomplished, the earthmoving activity monitored, the location where monitoring was conducted, the rock unit(s) encountered, the fossil specimens recovered, and associated specimen data and corresponding geologic and geographic site data. A final technical report of results and findings shall be prepared by the Paleontologist in accordance with any City requirement and archived at a repository mutually approved by the City and Paleontologist.

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Section 8 Figures, Tables and Appendices

List of Figures

Figure 1. Location of Fresno-Clovis Regional Wastewater Reclamation Facility, Fresno County, Central Valley of California.

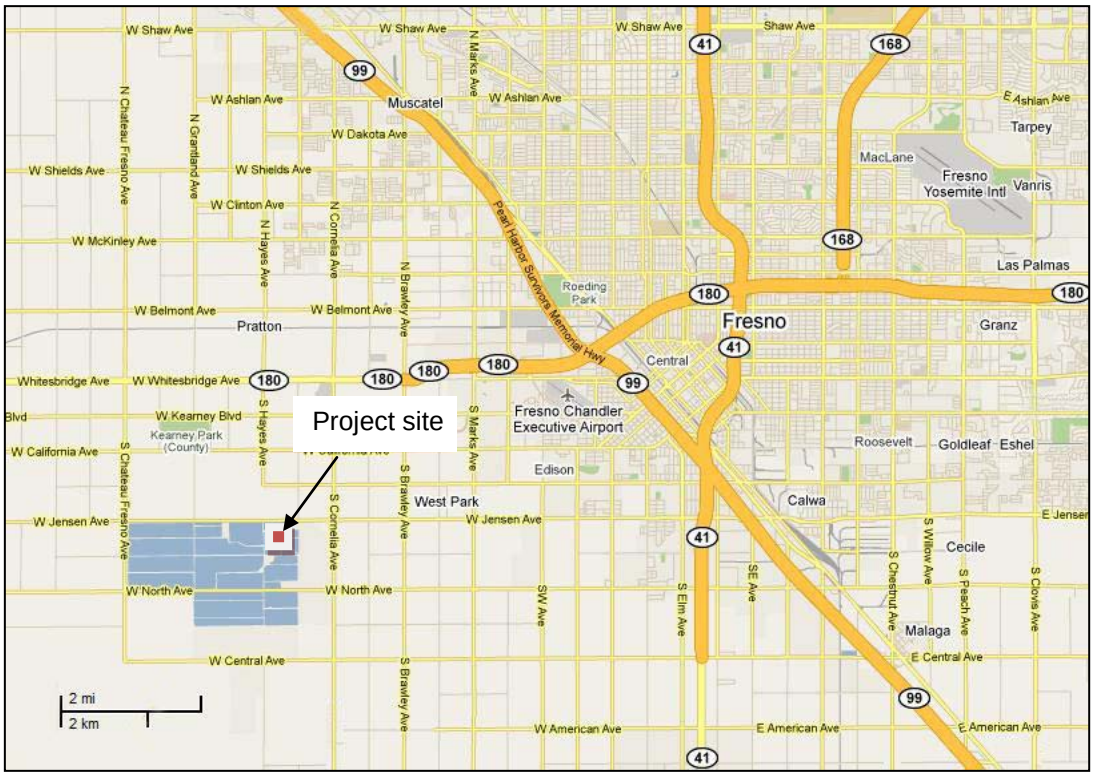

Figure 2. Location of Fresno-Clovis Regional Wastewater Reclamation Facility, City of Fresno, California. (Courtesy Google Maps)

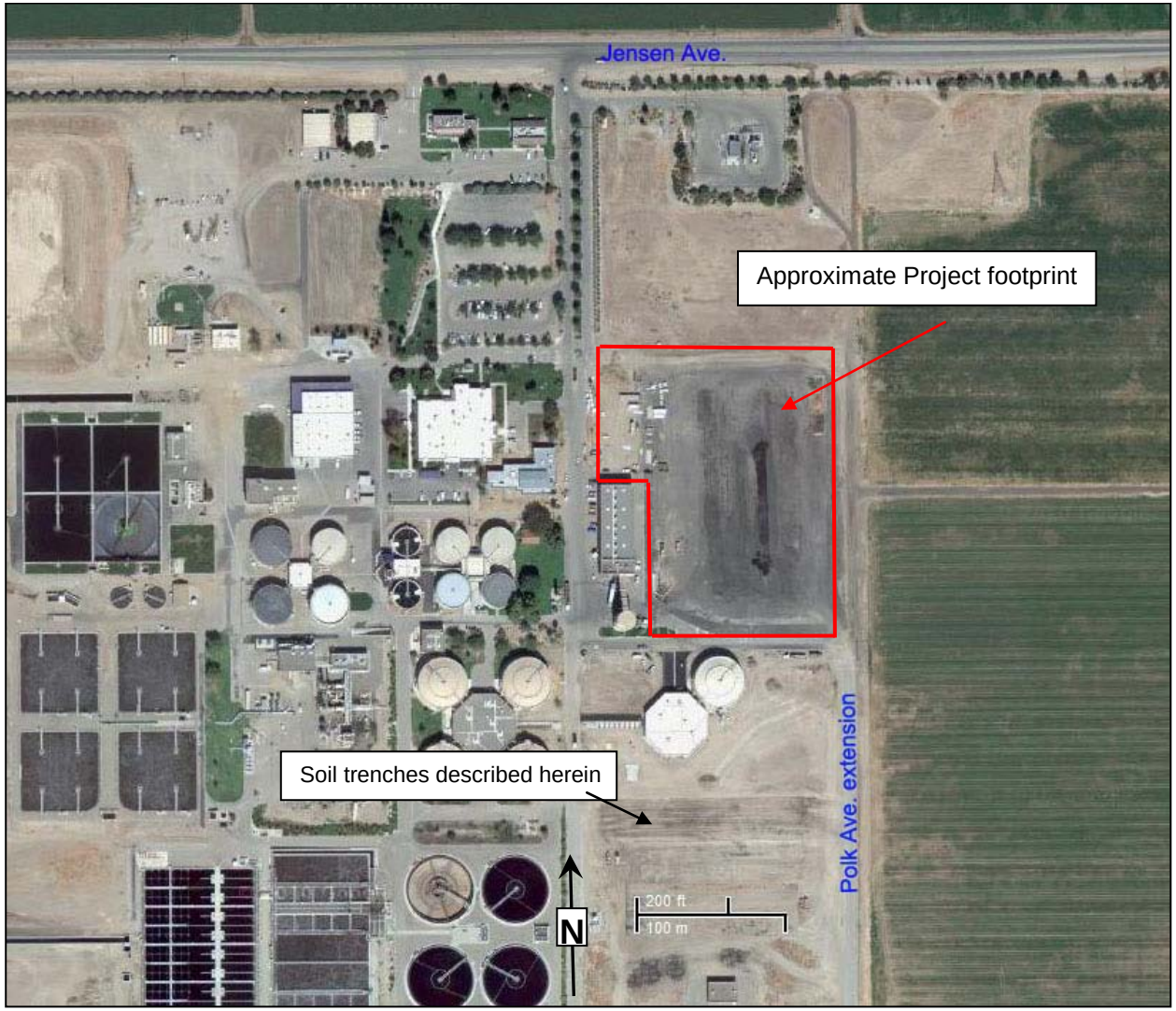

Figure 3. Location of expansion Project, Fresno-Clovis Regional Wastewater Reclamation Facility. (Image courtesy Google Maps from USDA data).

Figure 4. Project site, view to southeast. Fill in foreground, asphalt in back. Polk Ave. extension in far background.

Figure 5. Project site, view to northwest. Silo will be installed at location of gray trailer.

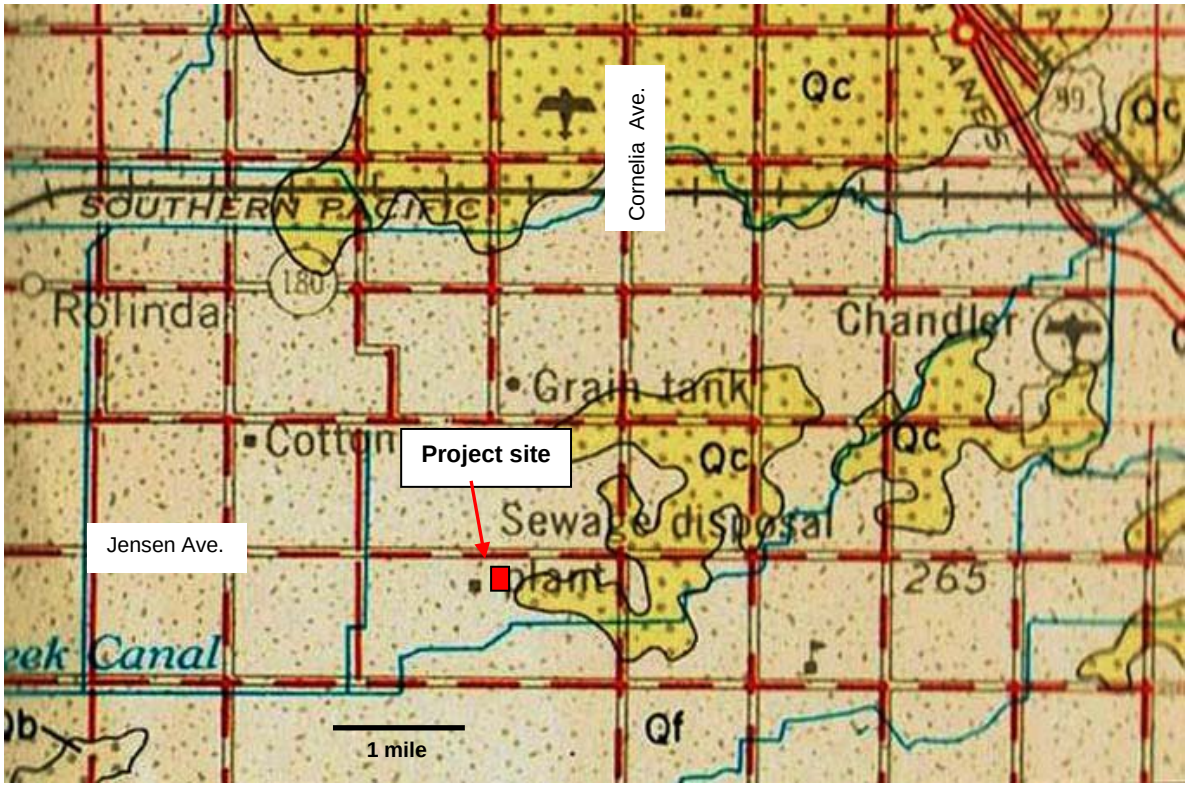

Figure 6. Generalized geologic map of the Project site. (From CDMG, 1991)
Qf = Quaternary alluvium **Qc** = Pleistocene sediments

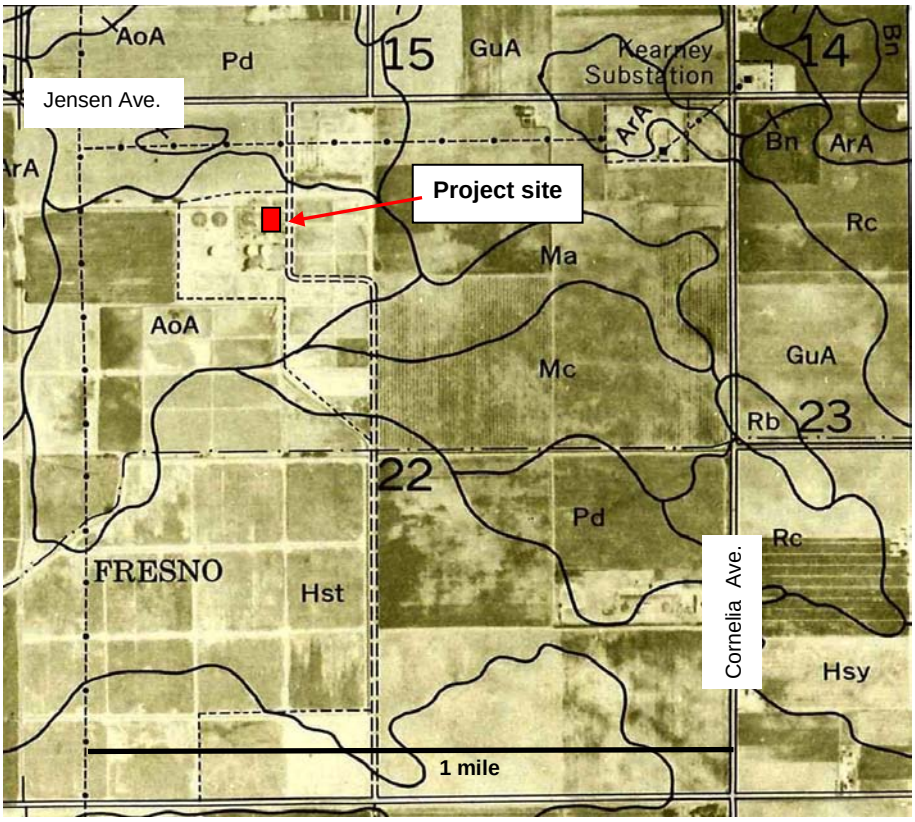

Figure 7. Soils map of the Project site. (From USDA, 1971, Sheet 60)
AoA= Atwater series **Ma, Mc** = Madera series. **Pd** = Pachappa series **Hst** = Herperia series.

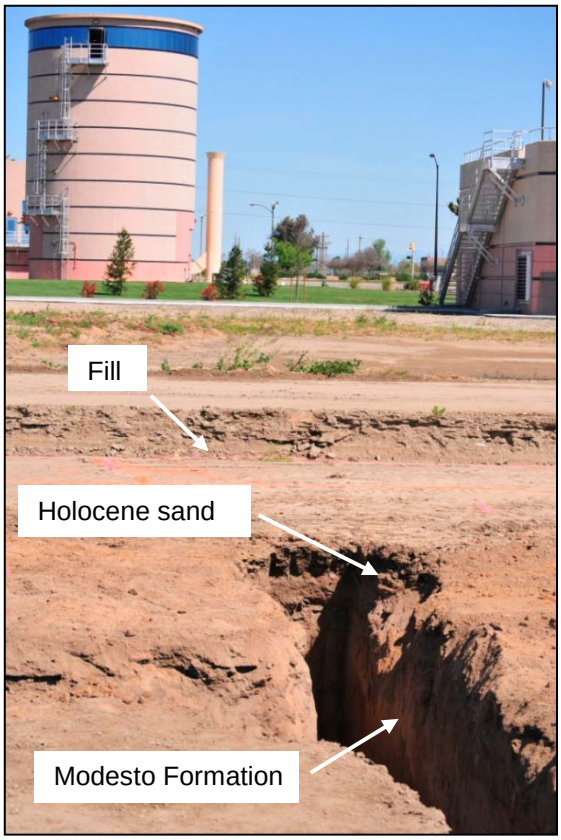

Figure 8. Soil trench, 350 feet south of Project site (see Figure 3), showing upper fill, Holocene sand and reddish soil of the Modesto Formation. Silo in background similar to one to be constructed.

Depth (ft)	Column	Description
0-2.7		**CLAY to SILTY SAND.** Gray, pebbly with fragments of asphalt, plastic, and glass. Well compacted. Abrupt planar lower boundary. (Fill.)
2.7-4.7		**SAND.** Medium gray brown (10 YR 7/2 - dry), well sorted, massive to crudely cross bedded. Granitic derived. Base channeled. Alluvial fan channel sand derived from Sierra Nevada. (Holocene sediment.)
4.7-7.0		**SAND-SILTY SAND**. Yellowish brown to reddish brown. Well bedded and moderately well indurated. Slightly clayey. Two paleosols. Upper soil: weakly developed Bt horizon (5YR 4/6 - moist) 3" thick. Lower soil: well-developed Bt with hard, blocky structure 6" thick. Strong brown (5YR 4/6 - moist) with reddish brown (7.5 YR 5/6) mottles. Abundant clay films on grain and ped faces. No duripan or carbonate nodules/seams. Two sequences of alluvial fan floodplain deposits and associated soils. (Modesto Formation.)
TD= 7.0		

Figure 9. Soil log of trench shown in Figure 8.

List of Tables

Table 1. Acronyms and abbreviations.

Bt	B soil horizon (clayey)
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CGS	California Geologic Survey
NEPA	National Environmental Policy Act
PER	Paleontological Evaluation Report
PIR	Paleontological Identification Report
PMP	Paleontological Mitigation Plan
PMR	Paleontological Mitigation Report
USGS	U.S. Geological Survey
USDA	US Department of Agriculture (Soil Conservation Service)

Table 2. Chronologic trends in development of B horizons in the San Joaquin Valley for sandy soils formed from granitic-derived alluvium. (Information from Harding, 1982; Birkland, 1974.)

Property	Description	Development
B Horizon	Zone of accumulation.	Becomes thicker and more defined.
Color*	Darkness; amount of red and brown.	Horizon becomes darker due to leeched organic matter. Changes from 10YR to 7.5 YR as redness increases, values decrease and chromas increase due to oxidation of iron minerals in sediment.
Texture	Clay formed by in-situ weathering and transported from overlying A horizon.	Increasing clay content makes horizon finer grained.
Structure	Aggregate type (clods) separated by cracks.	Changes from single particle grains to aggregate masses that increase in size and shape from blocks to prisms.
Duripan (Bqm)	Carbonate-silica-iron "hardpan". May be veins of carbonate, iron and manganese concretions ("shot")..	Thickens, darkens, hardens. Acquires platey structure. Increasing carbonate veins and shot.
Clay films	Transported and formed-in-place clay on surfaces.	Clay films increase from grain coatings to pore fillings and bridges and surfaces on ped faces. Thicken and become more numerous.
Consistency	Hardness and stickiness.	Both increase with increasing clay content.

***Munsell colors** (e.g. 10YR 5/7) are given as:

- Hue: the dominant wavelength measured as a ratio of the two colors indicated. 10YR = 10 parts yellow to 1 part red, 7.5 YR is redder because it has 7.5 parts yellow to 1 part red.
- Value: The quantity of light reflected. Lower numbers = less reflectance = darker colors.
- Chroma: The purity or saturation of color. Higher number = more saturation = more "pure" color.

Table 2. Generalized stratigraphy of Quaternary sedimentary units and associated soils, Northern San Joaquin Valley (From Marchand and Allwardt, 1981; Hardin, 1985; USDA, 1971)

UNIT (Environment)	DESCRIPTION/PALEONTOLOGY	THICKNESS at type section	AGE Range (yrs) Quaternary
ALLUVIUM, LAKE DEPOSITS	Undifferentiated sands, silty sands. Weakly developed A-C soils; usually disturbed. (E.g. Grangeville, Hesperia Tujunga). Grades westward to fine-grained, silt and clay Tulare Lake beds.	3-30 ft	Modern, **Holocene**
Unconformity			
MODESTO FM.	*Rancholabrean* vertebrate fossils: mammoth, mastodon, bison, horse, gopher, camel, coyote, antelope, deer, badger, turtle, rabbit.		**Pleistocene** 9,000 – 43,000 (12,000-73,000[1])
Upper unit. (Fans and lakes)	Uppermost lacustrine clay. Extensive aeolian sand with minor pebble gravel. Fine-grained sands, silt, minor clay of distal fans. A/C profiles or w/ weak cambic B horizon. 10YR to 7.5YR/4. E.g. Pachappa, Hanford, Fresno series.	On Kern fan at depth of 30 ft..	9,000-26,000
Lower unit (Fans)	Eolian sand. Arkosic alluvium derived from Sierra Nevada deposited in upper fan and terrace. Minor pebble gravel inc. metavolcanic clasts. Fine-grained, well stratified alluvium of flood basins and lower fans. Weak, pale colored, argillic soils. E.g. Borden series.	33 ft	26,000 – 43,000 Wisconsin glacial period
Unconformity			
RIVERBANK FM.	*Rancholabrean* vertebrate fossils including horse, coyote, sloth, bison, antelope, reptiles. Well-developed soils.		130,000 – 450,000 Illinoisian-Wisconsinian
Upper unit. (Single aggradational fan.)	Thin, lag gravel inc. metavolcanic clasts at top. Upward coarsening, arkosic, sandy channel alluvium. Inset into Turlock Lake and older Riverbank Fm. Well developed soils have Ca seams; well-developed Bt, ± weak to strongly developed Fe-Si duripans. E.g. Ramona, Madera, Snelling series.	41.5 ft.	
Middle unit. (Multiple flood events in fans.)	Arkosic sandy channel gravel with aeolian sands. Multiple soils having Fe-Si duripans and well developed Bt. (E.g. San Joaquin, Madera)		
Lower unit.	Thin, coarse, arkosic channel sands.	Variable	
Unconformity			
TURLOCK LAKE FM.	*Irvingtonian* vertebrate fossils bison, mammoth, deer, antelope, birds, snakes, turtles, sloths, cave bear, (Fairmead landfill)		
Upper unit. (Alluvial fan with lakes.)	Deeply dissected. Undifferentiated arkosic sands and gravel. Friant pumice and Corcoran clay markers. Extensive, thick, red soils having Fe-Si duripan. E.g. Montpellier, Whitney, Rocklin.	98 ft.	600,000
Lower unit (Alluvial fan.)	Cobble-to pebble gravel inc. andesite, metavolcanic clasts. Cometa series.		> 730,000 (Magnetically reversed)

[1] Atwater (1982)

Table 4. Sated surfaces via soil series, eastern Sacramento and San Joaquin Valley.

Soil Series	Associated Formation	Approximate Age (ka = thousand years)
Grangeville	Holocene	<10
Hanford	Modesto	10-40
Madera	Riverbank	100-300
Exeter	Riverbank	100-300
San Joaquin	Riverbank	100-300
Snelling	Riverbank	100-300
Rocklin	Turlock Lake	500-700
Montpellier	Turlock Lake	500-700
Whitney	Turlock Lake	500-700
Keyes	Laguna	1600-2000
Corning	Laguna	1600-2000
Redding	Laguna	1600-2000

(Source: California Soil Resource Lab, 2006, UC Davis Department of Land, Air and Water Resources website http://casoilresource.lawr.ucdavis.edu/drupal/node/368)

Appendices

A. Paleontological records search, LACM.

B. Geological time scale

Appendix A. Letter from S. McLeod (LACM) regarding paleotological data base search.

Natural History Museum of Los Angeles County
900 Exposition Boulevard • Los Angeles, CA 90007

Vertebrate Paleontology Section
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24 March 2010

Brady and Associates Geological Services
2703 North Adoline Avenue
Fresno, CA 93705

Attn: Roland H. Brady, III, Ph.D., P.G.

re: Paleontological resources for the proposed Jensen Fresno sludge dewatering facility Project, near Fresno, Fresno County, project area

Dear Roland:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Jensen Fresno sludge dewatering facility Project, near Fresno, Fresno County, project area as outlined on the portion of the Kearney Park USGS topographic quadrangle map that you sent to me via e-mail on 5 March 2010. We do not have any vertebrate fossil localities that lie directly within the proposed project boundaries, but we do have localities somewhat afield from sedimentary deposits similar to those that occur in the proposed project area.

Beneath the upper layers of soil and younger Quaternary Alluvium in the proposed project area there are late Pleistocene deposits of the Modesto Formation and possibly the older and sometimes underlying Riverbank Formation, probably derived primarily from the San Joaquin River that flows to the north. Our closest vertebrate fossil locality to the proposed project area from these types of deposits is LACM 7254, quite to the northwest immediately northeast of Chowchilla on the south side of Ash Slough, that produced a fossil specimen of elephantoid, Proboscidea.

Surface grading or very shallow excavations in the upper layers of soil and younger Quaternary Alluvium exposed in the proposed project area are unlikely to uncover significant vertebrate fossils. Deeper excavations that extend down into older Quaternary layers, including deposits of the Modesto Formation and the Riverbank Formation, however, may well encounter significant fossil vertebrate remains. Following the Society of Vertebrate Paleontology guidelines for paleontological mitigation, the paleontological sensitivity of the proposed project area is considered to be moderate. Any substantial excavations in the proposed project area, therefore, should be closely monitored to quickly and professionally collect any vertebrate fossils without impeding development. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: draft invoice

Appendix B. Geologic time scale.

ERA	PERIOD	MILLION YEARS		EPOCH
		DURATION	BEFORE PRESENT	
CENOZOIC	QUATERNARY (Q)		0.01	HOLOCENE (Recent)
		1.99	2.5	PLEISTOCENE (Qp)
	TERTIARY (T)	5	7	PLIOCENE (Tpl)
		19	26	MIOCENE (Tm)
		12	38	OLIGOCENE (To)
		16	54	EOCENE (Te)
		11	65	PALEOCENE (Tp)
MESO-ZOIC	CRETACEOUS (K)	71	136	
	JURASSIC (J)	54	190	
	TRIASSIC (TR)	35	225	
PALEOZOIC	PERMIAN (P)	55	280	
	PENNSYLVANIAN (P)	30	310	
	MISSISSIPPIAN (M)	35	345	
	DEVONIAN (D)	50	395	
	SILURIAN (S)	35	430	
	ORDOVICIAN (O)	70	500	
	CAMBRIAN (C)	70	570	
	PROTEROZOIC	1930	2500	
	ARCHEAN	1900	4600	

"Fossils"